ENGINEERING NEWS-RECORD

Building an umbrella for jet-plane passengers p.30

A McGRAW-HILL PUBLICATION

STEVENS INST TECH
UNIVERSITY MICROFILMS
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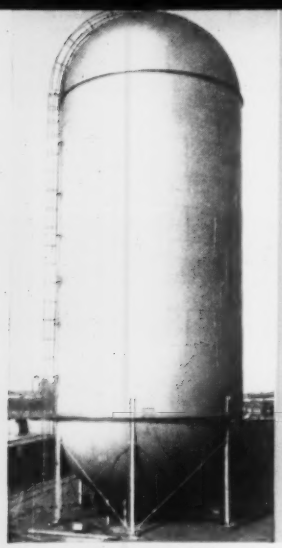
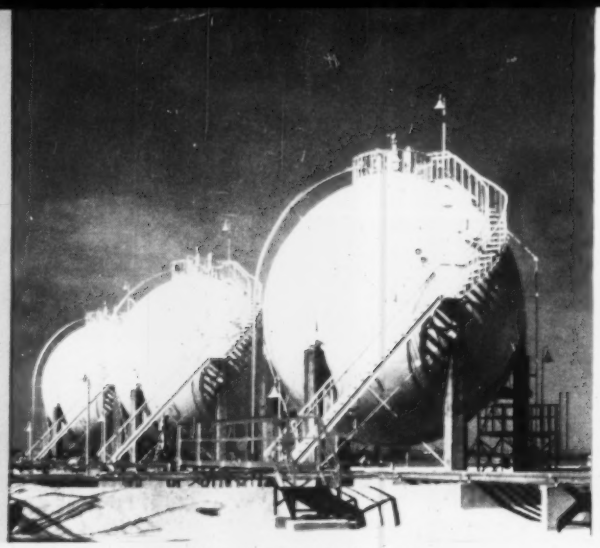


Pressure Gas Holder, 40' x 64'



30' Pressure Spheres, Gasoline

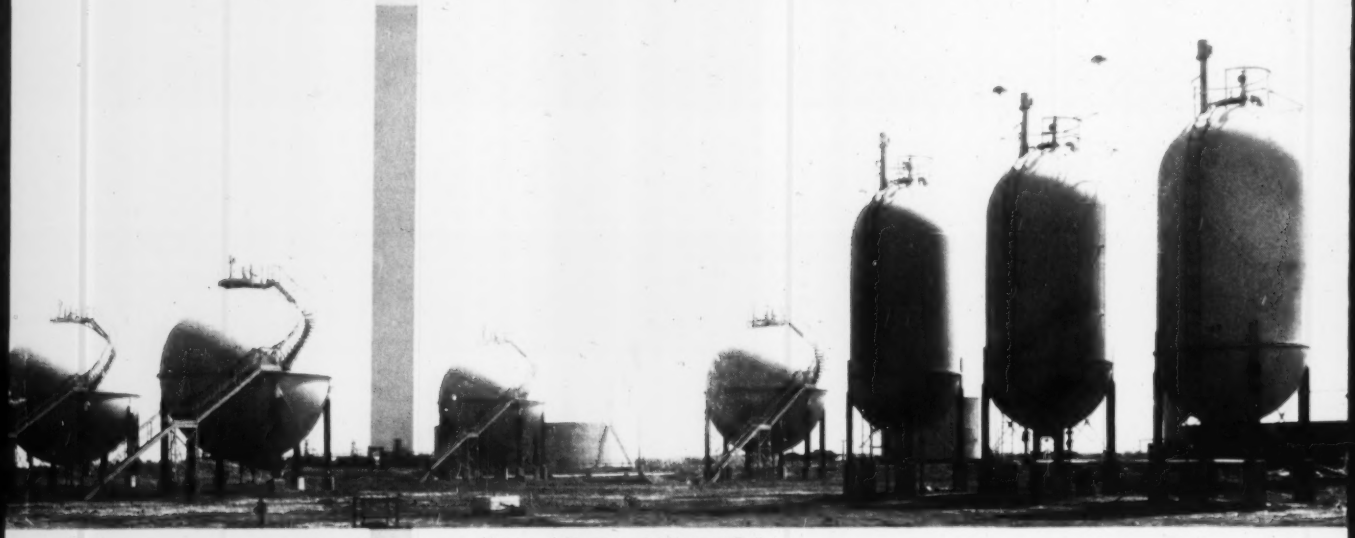
30' Pressure Spheres, Butadiene

EFFICIENT PRESSURE STORAGE OF VOLATILE PETROLEUM PRODUCTS

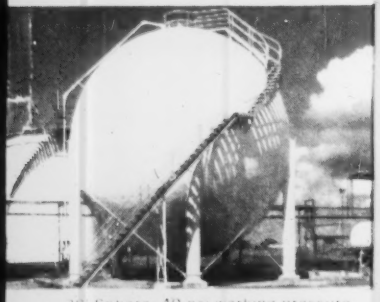
PDM
STEEL PLATE WORK

SPHERES and BULLETS

For gasoline, gases and many petrochemicals, compact Pressure Spheres and Bullets by Pittsburgh-Des Moines offer valuable savings of storage space and prevention of evaporation losses. Efficient design, dependable fabrication and expert erection, complete with all piping, valves and fittings, make PDM your logical choice for guaranteed satisfaction in modern pressure storage. Let us quote on your requirements.



Pressure Spheres and Vertical Bullets



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It's making the grade— at a 13-to-1 saving!

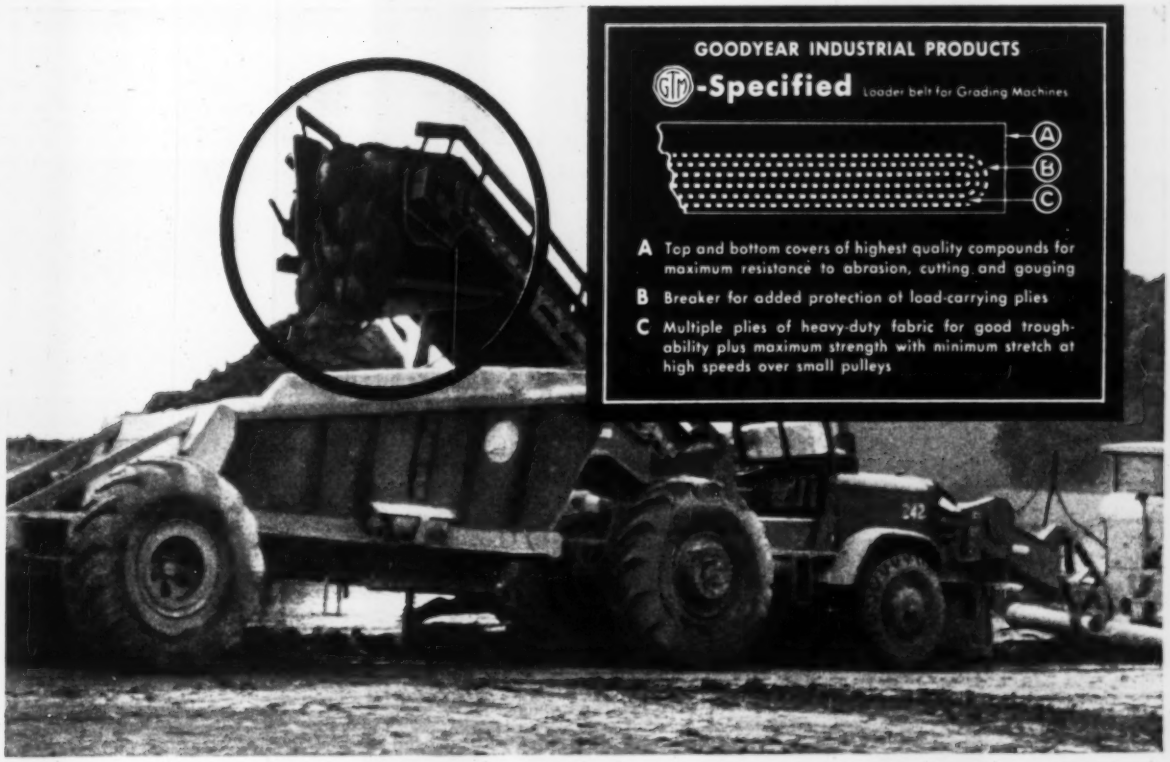
WHEN this top Eastern road builder hit a particularly tough, 18-mile stretch of grading, the belts on his big earth-loaders just couldn't take it. Under the staggering flow of 20% to 30% shale and rock, they failed after only 25,000 cubic yards. And replacements ran $2,000-plus apiece.

An SOS went out for the G.T.M.–Goodyear Technical Man. After some study, he recommended a belt especially designed for loader service. It's muscled with heavy-duty fabric for maximum strength with minimum stretch. And its super-tough cover is highly resistant to cutting, gouging and abrasion.

The pay-off: The G.T.M.'s belt handled 97,000 cubic yards on the first cut alone—*a phenomenal 337,000 cubic yards of the same murderous material—without a single take-up—before retirement.* That's 13 times previous belt life—*more than $25,000 saved—per loader.*

Even tremendous savings like these aren't unusual when the G.T.M. tackles the problem. To cash in on his famed cost-cutting abilities, contact him through your Goodyear Distributor—or write Goodyear, Industrial Products Division, Akron 16, Ohio.

IT'S SMART TO DO BUSINESS *with your Goodyear Distributor. He can give you fast, dependable service on Hose, V-Belts, Flat Belts and many other industrial rubber and non-rubber supplies. Look for him in the Yellow Pages under "Rubber Goods" or "Rubber Products."*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GTM-Specified Loader belt for Grading Machines
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B
C
A Top and bottom covers of highest quality compounds for maximum resistance to abrasion, cutting and gouging
B Breaker for added protection of load-carrying plies
C Multiple plies of heavy-duty fabric for good troughability plus maximum strength with minimum stretch at high speeds over small pulleys

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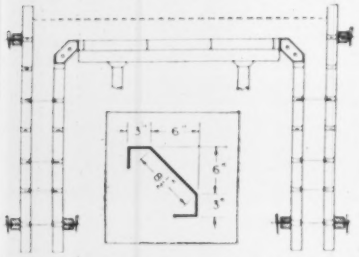
Job Finished 3 Weeks

How to Pour a Tunnel in a Hurry...

Symons Culvert Forms The Answer

When awarded a contract to build a 340 ft. tunnel, Schweiger Construction Company, Kansas City, Mo., faced the problem of how to do it fast and as economically as possible.

Symons Culvert Forms solved the problem. They eliminated the need for any special form or job-built construction.



Schweiger used Symons 1" steel channel filler horizontally on top of 6' vertical panels on the inside of the walls. Culvert Forms were placed on top of this filler. The forms underneath were stripped with no difficulty and the fillers and culvert forms were then removed without disturbing the decking for the slab, which was left in place for an additional curing period. Walls and top slab were poured monolithically in three pours. *Job was completed in three weeks.*

Symons forms, shores and column clamps may be rented with purchase option. Additional information on *Symons Culvert Forms* is available upon request.

Symons

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EIGHTY-FIFTH YEAR OF PUBLICATION

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5 NORTHWESTS

set the ball rolling for Chicago's Exhibition Center

Overlooking beautiful Lake Michigan in the shadow of Chicago's skyline the dirt is flying for a new tremendous Exhibition Center and Convention Hall. This $35,000,000 building will cover 8 acres of ground and have 700,000 sq. ft. of exhibition space.

George Krug and Edmier Inc., Chicago contractors, have set the ball in motion to put the excavation part of the job well on its way. Five Northwest Draglines are swinging out frozen, rocky and trash-ladened fill to keep the trucks on the run. Both contractors are Northwest repeat order owners.

Here again Northwests are proving their ability for speed and flexibility in the worst of weather conditions and the mean mixed digging. Northwest owners are the best Northwest salesmen. See these machines at work and then let a Northwest man give you complete details.

NORTHWEST ENGINEERING COMPANY
1502 Field Building, 135 South LaSalle Street,
Chicago 3, Illinois

A big Northwest Model 95 swings out another payload of frozen ground.

Here are two of Edmier's Northwests in the rocky, mixed digging. A 95 in front—a Model 6 behind.

Excavation moves fast on Chicago's Lake Front for the new Exhibition Center.

NORTHWEST Always Ready to GO

NORTHWEST EQUIPMENT IS BUILT IN THE FOLLOWING SIZES

SHOVELS	CRANES	DRAGLINES	PULLSHOVELS	TRUCK CRANES
¾ Yd. to 2½ Yd. Capacity	13-Ton to 50-Ton Capacity	¾ Yd. to 3 Yd. Capacity	¾ Yd. to 2½ Yd. Capacity	25-Ton and 35-Ton Capacity

D-95-10-1C

Only with Link-Belt Speeder ***Full-Function*** *design . . .*

all these features in one shovel-crane

STANDARD FEATURES	LS-98	OTHER 1-YD. MACHINES* Rig A	Rig B	Rig C	Rig D
• Full power hydraulic controls	X				
• Hydraulic power steering	X				
• Independent rapid boomhoist	X	X	X		X
• Fully interchangeable, self adjusting clutches	X				
• Two-speed travel in either direction through gear reduction	X	X			
OPTIONAL FEATURES					
• Reversing clutches for one drum	X	X	X		X
• Reversing clutches for both main drums	X				
• Boom lowering clutch	X			X	X
• Third drum without restricting any other function	X			X	
• Independent swing and travel without restricting any other function	X				
• Torque converters	X		X		X

*Ask your Link-Belt Speeder distributor for the facts behind this comparison.

Get a profit bonus with these standard features . . . tailor the machine to the job with these optional features

Exclusive with Link-Belt Speeder — revolutionary *Full-Function* design provides a separate power train for each machine function.

That's why you can have and use all these 11 major features on the same machine — without restricting other operations.

Practically double power train life

And that's why *Full-Function* design spreads wear over more clutches, shafts, gears and bearings. Only the power trains in use are under load!

But this is only one of the many Link-Belt Speeder advantages. You also get —

- **Greater usable horsepower**
- **Speed-o-Matic—proven power hydraulic controls**
- **Bonus crane capacity working with long booms at extended radii**

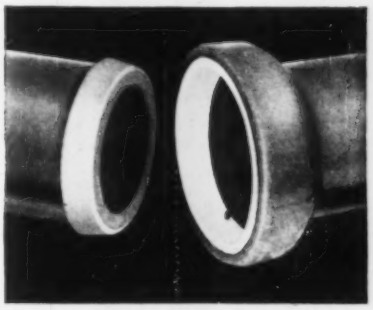
For complete details, contact your distributor. Or write Link-Belt Speeder Corporation, Dept. ENR-158, Cedar Rapids, Iowa, for Book No. 2553. 14,770

LINK-BELT SPEEDER

It's time to compare . . . with a Link-Belt Speeder

longer, stronger AMVIT Jointed Clay Pipe prevents infiltration SIX WAYS

Bottletight, Factory-Made Joint of Plasticized Resins of Polyvinyl-chloride gives lower cost-in-place



Engineering standard and specifications for sanitary sewers are written so that both the contractor and the community can obtain the best type of construction.

They limit the amount of infiltration in sewer pipe joints, which, in turn, reduces pumping and treatment plant costs. Amvit* Jointed Clay Pipe was especially designed to achieve best possible results.

1. FACTORY-MADE QUALITY

The Amvit Joint is manufactured from plasticized resins of polyvinyl-chloride. No other combination of materials is used or needed. It is applied on the pipe by a special manufacturing process and delivered to the job site ready for immediate installation.

2. DESIGN PREVENTS LEAKS

The Amvit Joint is a compression type joint based on the ball and socket principle. The material on the spigot end is a convex shape, with the bell end in a concave shape. Simply pushing the pipe together "makes" the joint, keeping the surfaces of the bell and spigot rings in constant compression. Thus, infiltration, exfiltration, and root penetration are prevented.

3. QUICK, FOUL-PROOF INSTALLATION

The joint is on the pipe delivered to the job site ready for immediate installations. No other materials such as caulking, joint compound, hot pots, or ladles are needed to make the Amvit Joint.

4. PERMITS DEFLECTION, ABSORBS SHOCKS

Amvit is made from a plastic which has many characteristics similar to rubber. It is pliable, permitting deflection without leakage. It is resilient, can absorb shocks, and vibration.

5. BETTER FLOW, LESS MAINTENANCE

The design of the joint assures that the pipe is self-centered at all times. This gives perfect alignment and self-cleansing action. Because the joint is really tight, no foreign matter such as dirt, sand, or stones can possibly enter the line.

6. COMPLETE FITTINGS

Amvit is furnished on all standard fittings, as well as pipe. This will permit a uniformly tight line from house to treatment plant.

Amvit Jointed Clay Pipe, in sizes 4" through 24", together with all fittings is available for immediate delivery in the Northeast and Central States.

For more information on how Amvit can help cut your sewer installation costs, write or call American Vitrified Products Company, National City Bank Building, Cleveland, Ohio, or our office nearest you, for this descriptive folder.

SINCE 1848

AMERICAN

American Vitrified Products Company

CLEVELAND OHIO

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LOOK *at a floor treatment that cures, hardens, seals*

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Western Electric Co., NYC
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Cleveland Cement Contracting Co.

3-WAY PROTECTION, 1-APPLICATION

The Western Electric Plant floor shown above resisted grease, paint, plaster, mud, ice and abrasive traffic during building construction with one application of one product! It was cured, hardened and sealed with WEST CONCRETE FLOOR TREATMENT.

WEST CONCRETE FLOOR TREATMENT saves labor, materials and time. It can be applied immediately after troweling. Avoids delays after pouring. Replaces as many as three separate products and applications. Eliminates labor required for cleaning after delayed drying between the use of separate products.

WEST CONCRETE FLOOR TREATMENT is a quick drying formulation. Even spreading. Easily applied by unskilled labor. It enables newly-laid wet concrete to retain 95% of its moisture. This permits curing and hardening while sealing and dustproofing the surface. Meets ASTM Specification C-309.

WEST CONCRETE FLOOR TREATMENT has been used successfully, for many years, in major private and public construction projects throughout the country.

For a sample and full details, contact any West office in principal cities. Or send the coupon below to our Long Island City headquarters. Dept. 23.

☐ Please send a sample and full details on WEST CONCRETE FLOOR TREATMENT.

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Pneumatic-tired SB-60 in travel position. Screed, feeder and idler crawlers under hopper hydraulically raise for travel.

Pneumatic-tired SB-60 (shown). Model SA-60 has crawlers 3 ft. high.

TWO NEW

heavy-duty...high-capacity...high-speed FINISHERS

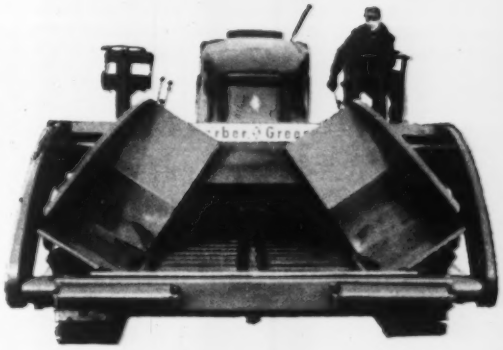
CRAWLERS or PNEUMATICS

Model SA-60 Model SB-60

Designed throughout for heavy-duty, high-capacity, low-maintenance operation, these two new Barber-Greenes offer the ultimate in high-tonnage production. They reduce nonproductive time, lay more miles per day at less cost per ton.

New design concepts give unequaled speed and maneuverability... 100% power steering (no clutches—no steering axle)... faster truck contact, discharge and release . . . feeder and screw speeds independent of travel speed . . . new automatic feed control . . . articulated, stabilized suspension . . . new unitized-construction . . . improved automatic leveling . . . hydraulically operated, high-speed tamper.

FOUR DIFFERENT FINISHERS. Only Barber-Greene offers a line of four finishers: the new 873, which paves on crawlers and travels on rubber; the new heavy-duty SA-60 and SB-60, shown above; and the famous 879-B unmatched for all types and sizes of jobs.



Self-cleaning, hydraulically operated hopper extends to extreme rear of chassis where gates are located.

These are just the high spots. Ask for complete information.

59-1-P

Barber-Greene BG

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4-D

WROUGHT IRON IN ROAD-BUILDING APPLICATIONS keeps maintenance to a minimum

WHERE TO USE IT:

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- electrical conduit
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- hand railings
- curb plates
- scuppers
- bridge decks
- service building piping
- pier protection
- lamp posts
- tie bars, dowels
- fasteners

Write for technical data on specific applications

BYERS 4-D WROUGHT IRON

Tubular and Flat Rolled Products

A. M. Byers Co., Pittsburgh 22, Pa.

Making Schools Fire Safe

Sir—Your article about how to make schools fire safe (ENR Jan 22, p. 21) is fine as far as it goes. However, more requirements should be incorporated.

Similar fires have occurred in multi-storied buildings other than schools, including the La Salle Hotel fire in Chicago and the Winecoff Hotel fire in Atlanta, both in 1946.

The fires were similar in that the fires started in the lower stories, but most deaths occurred in the upper floors. In all cases the deaths in the upper floors were not caused directly by the flames, but by the smoke and hot gases.

Once in a stairwell, smoke rises to the top; when it strikes a fire-resistive ceiling, it seeks another outlet. Unfortunately, in the cases cited, the lack of fire doors or failure of fire doors to function, permitted the smoke to escape horizontally through the corridors, thence through the classrooms or bedrooms and out the windows. Everyone in this path was killed.

If smoke vents had been provided through the roofs of these stairwells, the smoke could have escaped vertically and little or no smoke would have entered the corridors.

Such venting might cause a more intense fire, resulting in greater structural damage and more problems for the firemen, but the safety of the occupants should be considered first.

A study of the picture of the Chicago school appearing in ENR after the fire shows some smoke stains above the stairwell windows, but much greater stains above the classroom windows. This would appear to be due to the fact that the head of the stairwell window was well below those of the classrooms and therefore the smoke went to the highest possible opening to escape.

Many building codes recognize this fact and require smoke vents in elevator and ventilation shafts—but not in stairwells! General Motors rediscovered this principle after its Livonia, Mich., fire, and now requires its factories to be subdivided into fire zones, each separately smoke vented.

Another item discovered in similar fires is that heavy smoke in the corridors hides the exit signs and blocks out hallway lighting; therefore, exit signs should be lowered and auxiliary emergency lights provided near the floor.

To sum up, add two requirements to your list:

- Provide smoke vents at the top of new and existing stairwells.
- Install emergency signs and lights at a lower level.

THOMAS B. SHARKEY
B. G. Danis Co.
Dayton, Ohio

Sir—To your article, "School Fires—What Must Be Done?" I would like to add a few more safety suggestions.

- In all old schools where the floor framing, subflooring and finished flooring are wood: Either rip up the finished flooring or install over it at least two layers of asbestos paper, or a layer of sheet rock, and noncombustible asphalt tile.
- Provide for each classroom (under lock and key of the teacher, if necessary) a rope and aluminum rung ladder designed to securely hook over the entire sill and to extend 3 ft beyond the sill of the story below.
- Build a brick pit in the school yard or at the alley line to be used for the daily burning of trash. No trash is to be left anywhere, or "stored" temporarily, anywhere, in any container, of any kind. The reason: Such containers are easily accessible to the boy or girl who wishes to "chuck" a forbidden cigarette.
- Install a fire-alarm system that has a higher frequency than the school class bell and that will ring in all areas.
- Show the students movies of past school fires. Emphasis should be placed on avoiding panic.
- Install connecting doors between classrooms as a safety feature against corridor fires.

LOUISE K. MALDER
Chicago, Ill.

Engineering News-Record welcomes expression of opinions from its readers. Comment should be as brief as possible and pertinent to subjects of current construction importance. Letters should be addressed Editor, Engineering News-Record, 330 W. 42nd St., New York 36, N. Y.

For Your Calendar . . .

American Society of Photogrammetry, Shoreham Hotel, Washington, D. C., Mar. 8-13.

American Railway Engineering Association, Sherman Hotel, Chicago, Ill., Mar. 9-11.

American Society of Mechanical Engineers Aviation Conference, Statler Hilton Hotel, Los Angeles, Calif., Mar. 9-12.

Georgia Highway Conference, Georgia Institute of Technology, Atlanta, Ga., Mar. 9-10.

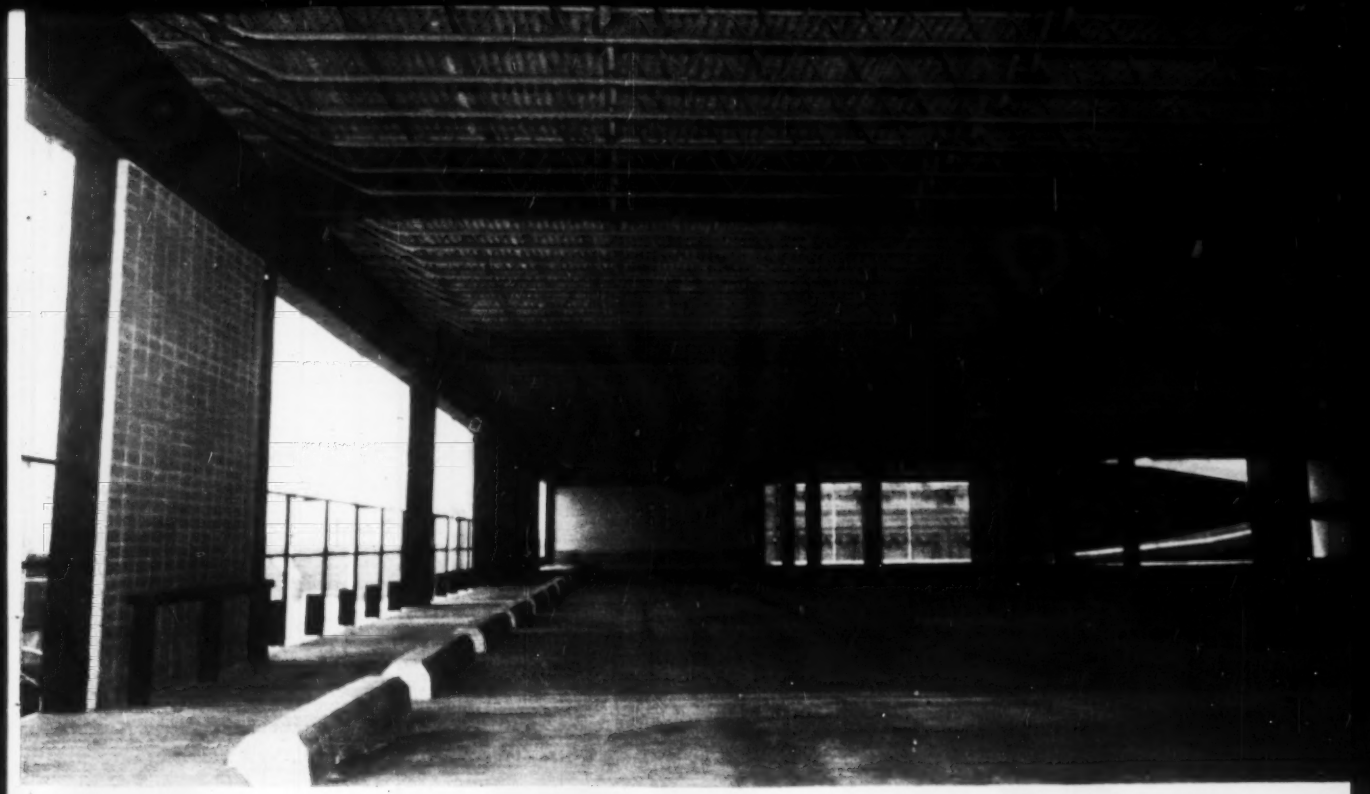
American Congress on Surveying and Mapping, Shoreham Hotel, Washington, D. C., Mar. 11-14.

9th Annual Iron and Steel Conference, Fort Roosevelt Hotel, Pittsburgh, Pa., Mar. 11-12.

55th Annual Convention of the Association of Highway Officials of the North Atlantic States, Hotel Traymore, Atlantic City, N. J., Mar. 18-20.

Mississippi Valley Conference of State Highway Departments, Annual Convention, Edgewater Beach Hotel, Chicago, Ill., Mar. 19-21.

51st Annual American Power Conference, Hotel Sherman, Chicago, Ill., Mar. 31-Apr. 2.



USS AmBridge Steel Joists

safely support 118,125 sq. ft. of parking space!

THIS new 9-level parking garage in downtown Gary, Indiana, is a good example of all-weather construction.

Erection of the 340-car, 125′ x 210′ x 45′ steel-frame building proceeded without interruption right on through the winter. Cold weather did not interfere with the construction of 118,125 sq. ft. of floors, since AmBridge Standard Steel Joists could go up independent of the flooring. Thus, concrete could be poured immediately after each level was completed, or at any convenient time.

This carport was designed by Beine, Hall & Curran, Architects and Engineers, and constructed by Witter-Gaddis Corporation, both of Gary. American Bridge fabricated and erected 189 tons of AmBridge Standard Steel Joists and erected 500 tons of structural steel.

USS AmBridge Steel Joists provide rigid, lightweight and economical construction for any type of floor, roof and ceiling.

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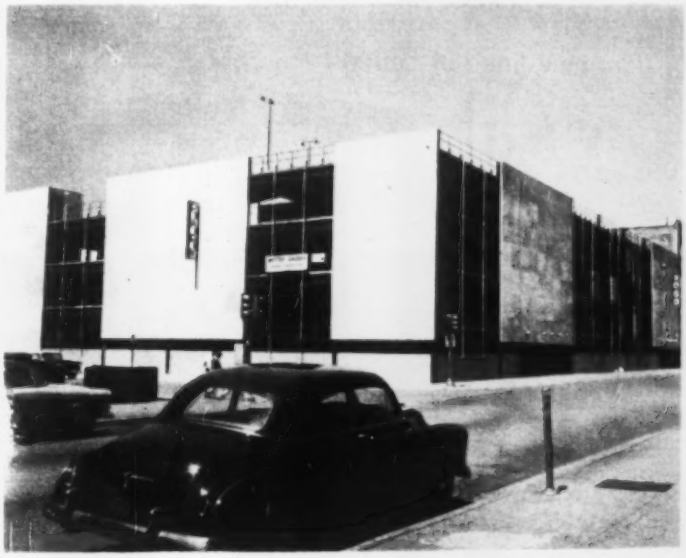

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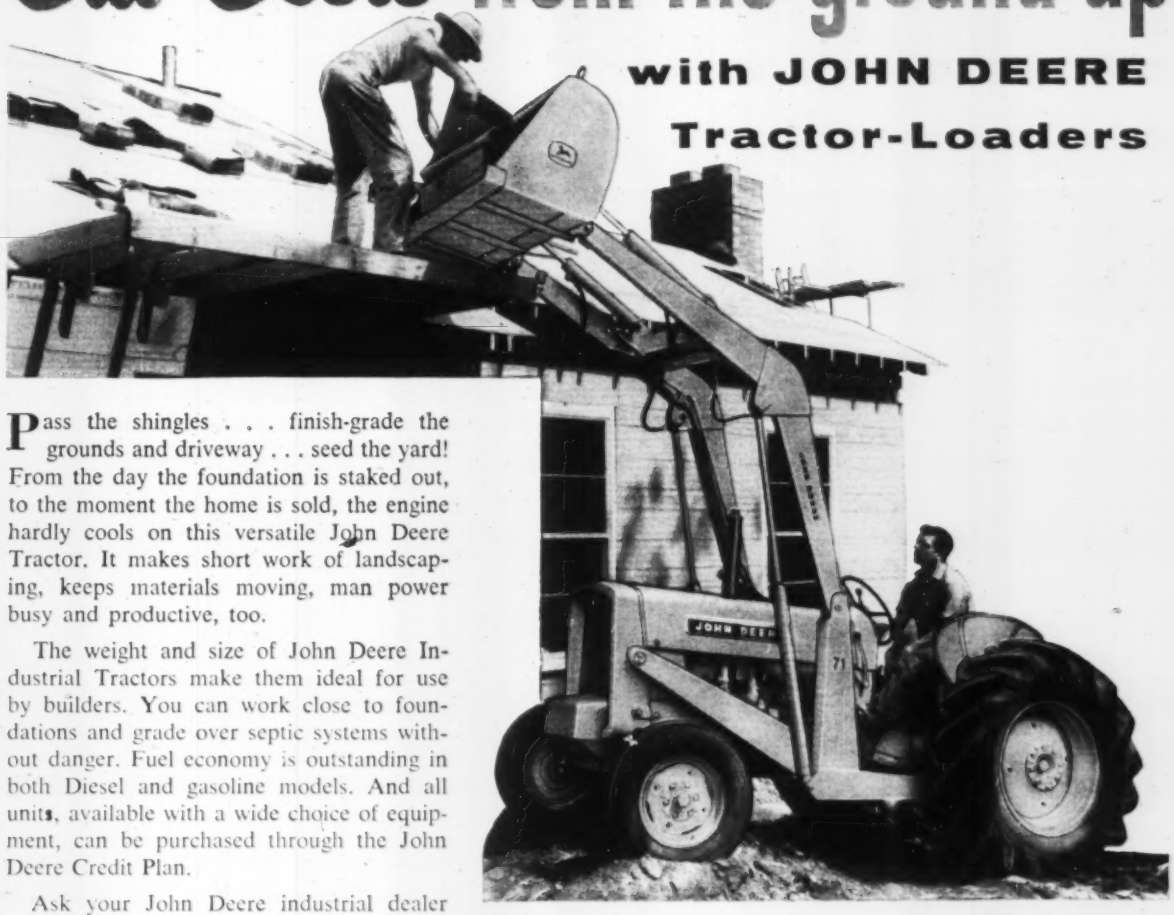

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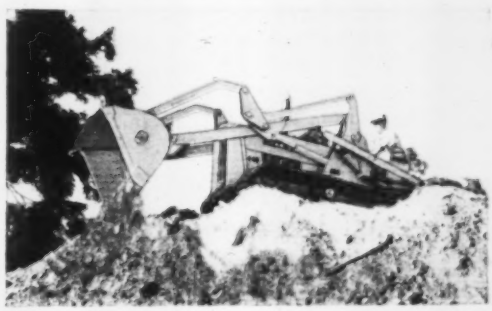

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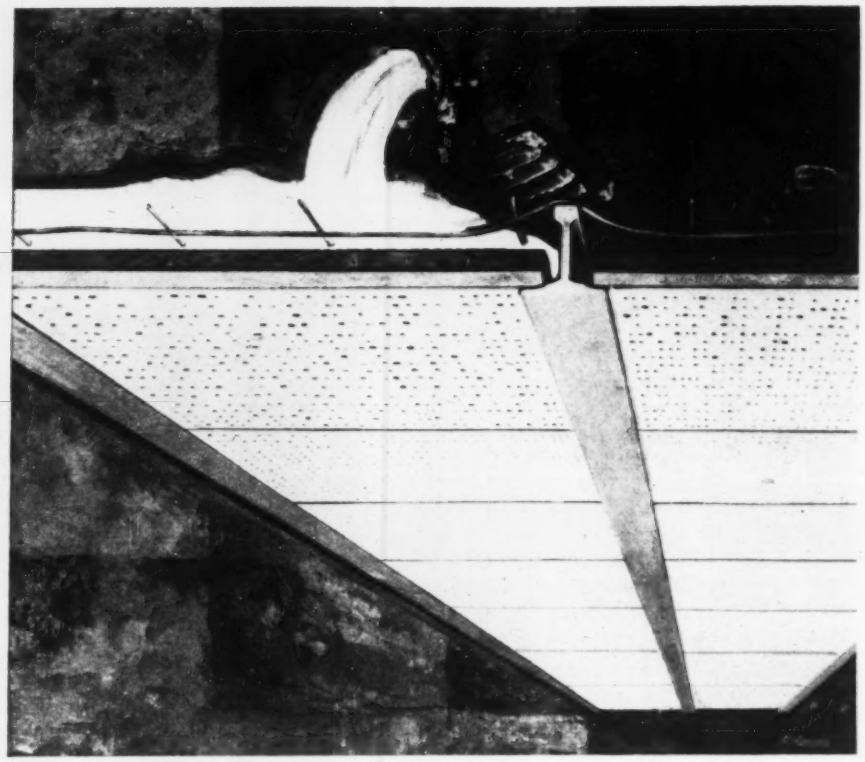

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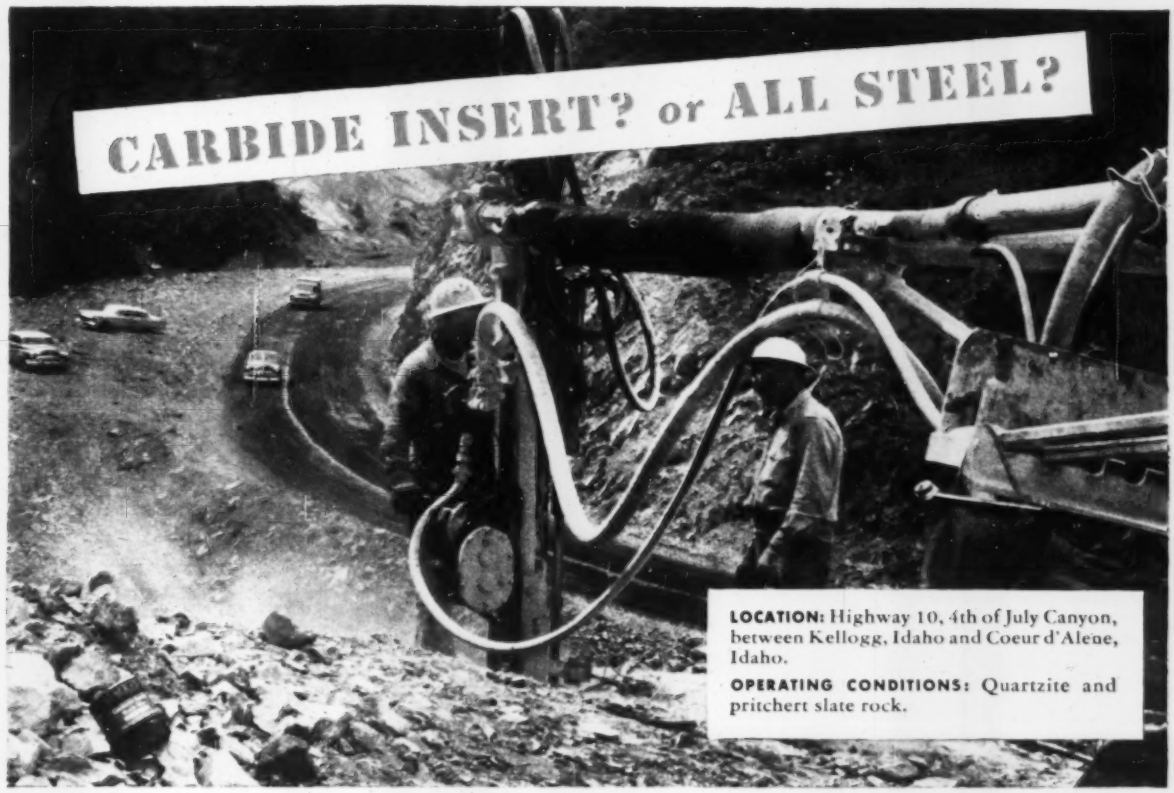
CARBIDE INSERT? or ALL STEEL?
LOCATION: Highway 10, 4th of July Canyon, between Kellogg, Idaho and Coeur d'Alene, Idaho.
OPERATING CONDITIONS: Quartzite and pritchert slate rock.

"We get more re-grinds per bit, lower cost with TIMKEN® carbide insert bits"

. . . Reports F. H. Slate and E. C. Hall Co.

IN constructing 7.2 miles of new four-lane highway in 4th of July Canyon between Kellogg, Idaho and Coeur d'Alene, Idaho, F. H. Slate and E. C. Hall Co. must drill through quartzite and pritchert slate rock. Using Timken® carbide insert bits, they average 12 to 14 re-grinds per bit, drill 20 to 100 feet of blast hole per pass. And with proper grinding, they use all of the carbide height with no fracturing of carbides when discarded. Bit cost per foot-of-hole stays at the minimum, production at the maximum.

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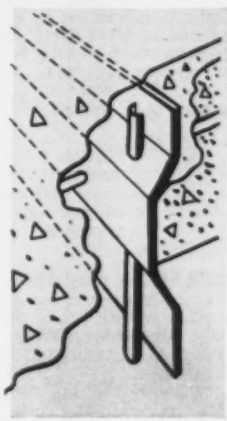
Illinois Tollway contractors find economy in Kapco tongue & groove joints

The new Illinois Tollway provides the motorist with four to six lanes of 10-inch reinforced concrete, plus 11-foot outside shoulders for emergency parking and 4 to 5-foot inside shoulders for extra safety in passing.

KAPCO TONGUE AND GROOVE JOINTS—the preformed mastic board that offers these *plus features at real economy*—were used on this modern highway:



- **Rigidity.** More than sufficient strength to resist the deforming forces of concrete placement.
- **Weatherproof.** Won't rust, rot or absorb more than 8% water by test.
- **Durability.** Provides effective bearing surface between slabs to prevent joint spalling . . . absorbs slab expansion without extrusion.
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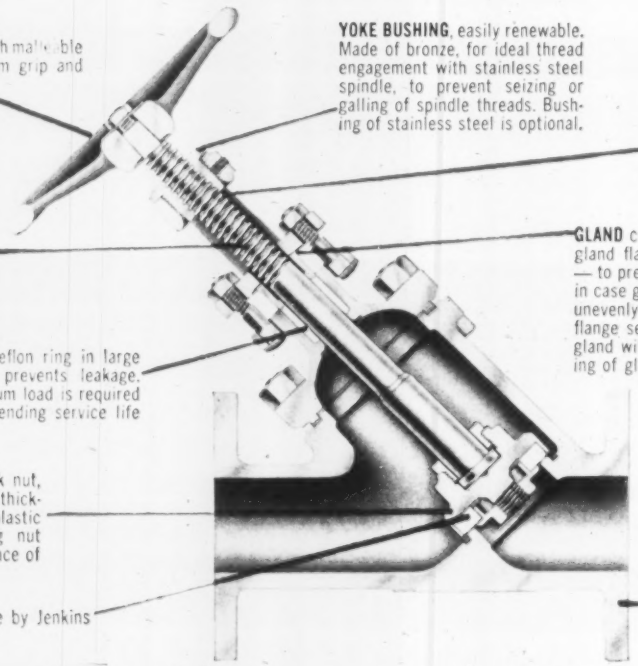

WHEEL of high strength malleable iron designed for firm grip and easy operation.

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ENGINEERING NEWS-RECORD

Vol. 162, No. 9 March 5, 1959

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THE CONSTRUCTION WEEK

WANAPUM WAMPUM COMING—Bid calls for the $200-million Wanapum Dam are expected to go out about April 1; they'll be opened about June 1. Wanapum is 18 miles upstream from Priest Rapids Dam on the Columbia River, Washington.

HALF-BILLION-DOLLAR WEEK—Heavy construction contracts this week topped half a billion dollars for the first time in over a year. The $523-million total lifts contracts 24% higher than a year ago. Moreover, the construction market shows great strength across the board. Industrial building is now 7% ahead of last year.

SWAPPING DEPTH FOR AREA—Deeper water in the pumped-storage reservoir of New York State's Niagara Power Project will partly make up for a decrease in area. Unable to obtain 1,383 acres of Tuscarora Indian land that figured in original plans, the State Power Authority said it would ask for a permit to beef up the dikes and raise the water level 10 ft on a smaller area.

ON SECOND THOUGHT—California's Gov. Edmund G. Brown has had a $13.5-million second thought about his January water message to the state legislature (ENR Jan. 29, p. 27). Following a new recommendation of a board of engineering consultants, he wants the additional money to start construction this year on Oroville Dam.

TOO MANY IFS?—If the Mid-Manhattan Expressway is built from the East River to the Hudson River across 30th St. in New York City and if enough tenants can be signed up,—Webb and Knapp will erect the world's largest office building. It would straddle the Pennsylvania Railroad tracks on a two-block site near Pennsylvania Station, contain 5 million to 10 million sq ft of floor area.

TEAM COMPLETE—Turner Construction Co., New York City, has been named general contractor for the $10-million United Engineering Center. That completes the team that will design and build the headquarters for the nation's engineering societies. The building will go up on New York City's United Nations Plaza. Other members of the team are Shreve, Lamb and Harmon Associates, architects; Seelye, Stevenson, Value and Knecht, structural engineers; Jaros, Baum and Bolles, mechanical engineers.

STANDARDS OPTIONAL—FOR AWHILE—Home builders may use the Federal Housing Authority's new Minimum Property Standards anytime between April 1 and July 1. After that its mandatory. The new codes replace FHA's Minimum Property Requirements.

ALLIS-CHALMERS ACQUIRES S. MORGAN SMITH ...FORMS NEW HYDRAULIC DIVISION

On February 1, the S. Morgan Smith Company became a part of Allis-Chalmers. Extensive A-C facilities in Milwaukee, together with two S. Morgan Smith plants in York, Pennsylvania, are now operating as the newly created Allis-Chalmers Hydraulic Division.

In acquiring S. Morgan Smith, A-C combines its own broad background in hydraulics with the 80 years of diversified engineering and manufacturing knowledge of SMS.

The York facilities will be devoted to the continued research, design, engineering and fabrication of a complete line of hydraulic turbines and accessories, pumps and pump-turbines, valves for industrial, waterworks and power applications, and specialized heavy equipment.

Product information or engineering help can be obtained from your nearby Allis-Chalmers office, or by writing Allis-Chalmers, Hydraulic Division, York, Pennsylvania.

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WASHINGTON OBSERVER

- **Meany: Taft-Hartley changes or nothing**
- **Stalemate over Highway Trust Fund**
- **Builders fight Davis-Bacon extension**

● **The biggest legislative conference of building trades officials was putting pressure on Congress this week.** Some 3,000 representatives jammed the halls of the Senate and House to lobby for the labor law amendments the building trades unions want.

AFL-CIO chief George Meany promised the conference the federation would go all out to defeat any bill that didn't have the three Taft-Hartley amendments on the building trades "must" list. They are: the seven-day union shop, a green light for pre-hire contracts and approval of employer payments to apprentice training funds.

Mr. Meany told the huge gathering that it's now or never for these building trades amendments. If they can't be included in this year's labor legislation, then it will be a long, long time before they'll have a chance again.

● **Commerce officials tried hard last week to stir up Congressional interest in the plight of the Highway Trust Fund** and the future of the construction program. The new Undersecretary of Commerce, John J. Allen, Jr., and Highway Administrator Bertram D. Tallamy spent most of their time before the Senate Public Works Committee explaining the present state of the financing.

Congress must step in and beef up the Trust Fund soon or the Bureau of Public Roads can't make 1961 apportionments to states.

But Congress doesn't appear to be excited over the matter. So far, no proposals have been made to ease the road program over its current snag. No one looks for any cut in the size of the program, so it leaves Congress and the Administration in a stalemate. Congress won't agree to the increased taxes President Eisenhower wants; the President won't agree to the deficit financing Congress wants.

Any cutback in the current progress of the highway program would be felt immediately by the states. Nine states have already started using their 1960 Interstate money. Ohio, for example has obligated 96% of its 1960 money and will have to cut back progress sharply if there is a delay or reduction in the 1961 apportionment. Eighteen states have obligated over 50% of 1959 Interstate money; seven are still using 1958 funds. Here is how the ABC program is going: seven states are using 1960 money; 27 states have used more than 50% of their 1959 money; and three states plus Hawaii, Puerto Rico and the District of Columbia are still using 1958 money.

● **Contractors will fight any extension of the Davis-Bacon law to include all federal-aid highway construction.** The law now applies to all work on the Interstate network, on which the federal government pays 90% of the cost. Labor is backing the new bills to bring the 50-50 ABC road construction under the prevailing wage law.

The contractors' main objection centers around job classification, rather than the wage level itself. Classification has been the main bone of contention so far on the Interstate System. Labor Department representatives have the last word on whether a worker doing a given job is to be paid, say, as a laborer or as a skilled worker.

US RUBBER CONVEYOR BELTS

"They proved themselves in our first 10 plants, so we picked them for our 11th!"

says director of sand and gravel company

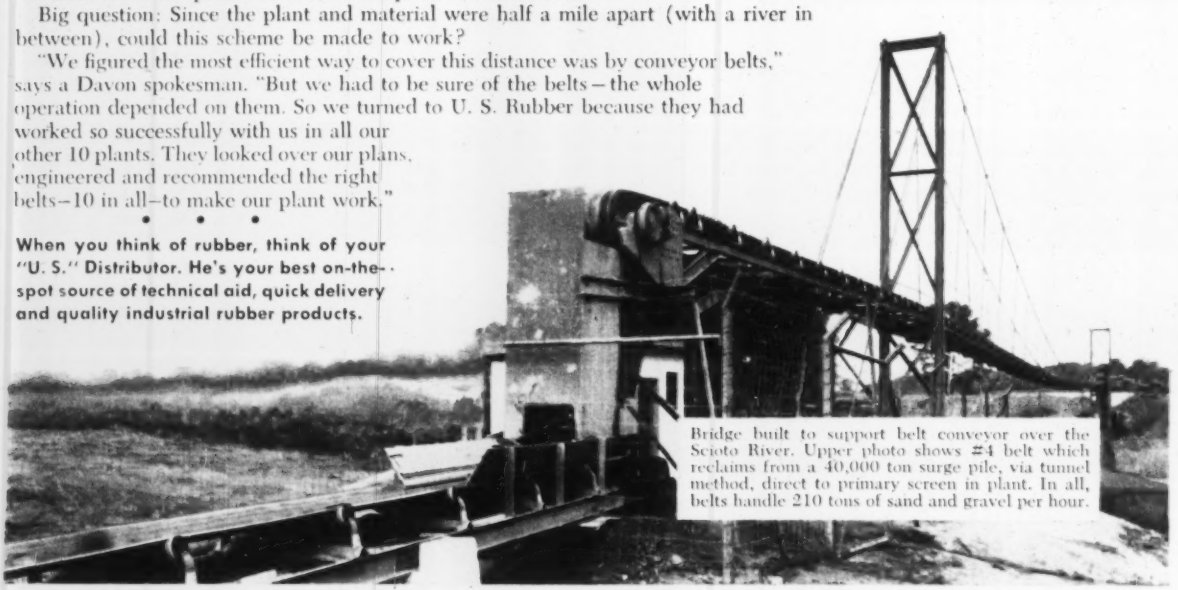
When Davon, Inc., built its 11th plant recently, they decided it would be more economical to bring the material to the plant rather than the plant to the material.

Big question: Since the plant and material were half a mile apart (with a river in between), could this scheme be made to work?

"We figured the most efficient way to cover this distance was by conveyor belts," says a Davon spokesman. "But we had to be sure of the belts – the whole operation depended on them. So we turned to U. S. Rubber because they had worked so successfully with us in all our other 10 plants. They looked over our plans, engineered and recommended the right belts – 10 in all – to make our plant work."

• • •

When you think of rubber, think of your "U. S." Distributor. He's your best on-the-spot source of technical aid, quick delivery and quality industrial rubber products.



Bridge built to support belt conveyor over the Scioto River. Upper photo shows #4 belt which reclaims from a 40,000 ton surge pile, via tunnel method, direct to primary screen in plant. In all, belts handle 210 tons of sand and gravel per hour.

US RUBBER

Mechanical Goods Division

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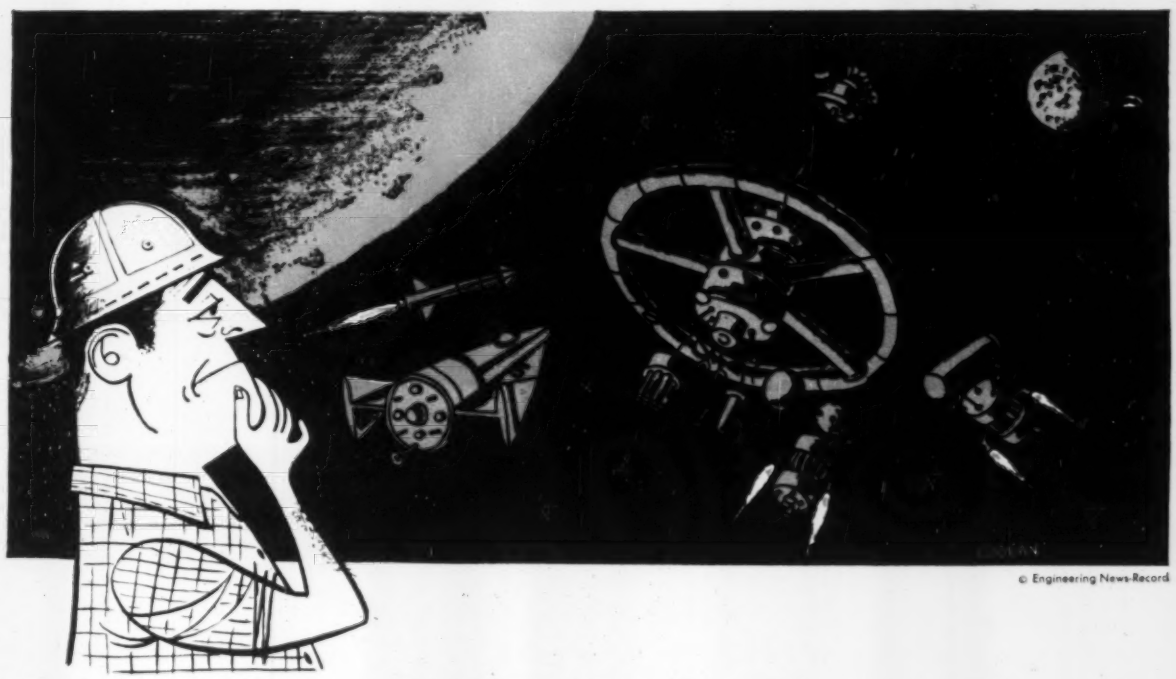

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Space Age: What's in It for You?

New developments keep making it clear that the U. S. is well launched into the Space Age.

Just last week the new Space Administration outlined plans for whole families of satellite-launching missiles which will have names like Vega, Centaur and Scout.

Space Administrator T. Keith Glennan told Congress "this is the last time" his agency will seek a budget below a half-billion dollars. Fiscal 1960's budget for the space agency alone is $845.5 million, and the U. S. is estimated to be pumping $1 billion a year into the total space program.

And that's just the beginning. Spending is expected to climb into the billions over the next few years.

How much of the money will go to construction men? Quite a bit.

For every space object this country puts into orbit, there will be a net of facilities needed on earth to service them. And that's where many construction firms can find new business. The many different types of satellites, manned space ships and space platforms that are in the offing will call for substantial ground construction, including tracking stations, testing laboratories, data-receiving centers, research laboratories and launching pads. Many observers believe the big money will be in this support work.

The Army is even now working on the development of cargo-carrying rocket ships (Project Lobber) and some space experts foresee an intercontinental, quick-delivery rocket postal service. These projects also will require ground facilities.

And how about platforms in outer space and stations on the moon? Many space experts expect to see them within the next decade.

Anything built in space or on the moon will be a highly complex mechanism, requiring the same kind of scientific and engineering talents that today's missiles call for. The government's space agency expects to use the aircraft and missile companies for these projects.

But a few big construction firms are planning and hoping to get in on the act by enlarging the scope of their operations (see next page).

Several aircraft and missile companies have made studies on how to handle the "in-space" jobs. Lockheed's Missile Systems Division, for example, put in eight months' work and spent about $200,000 on a study of how to assemble a multimanned satellite in outer space. The plan developed calls for rocketing a series of 10-ft-dia, 20-ft-long cylinders into orbit. They would be guided into a cluster. Then a space tug—dubbed an astrotug—with a three-man crew would assemble them and activate the space station.

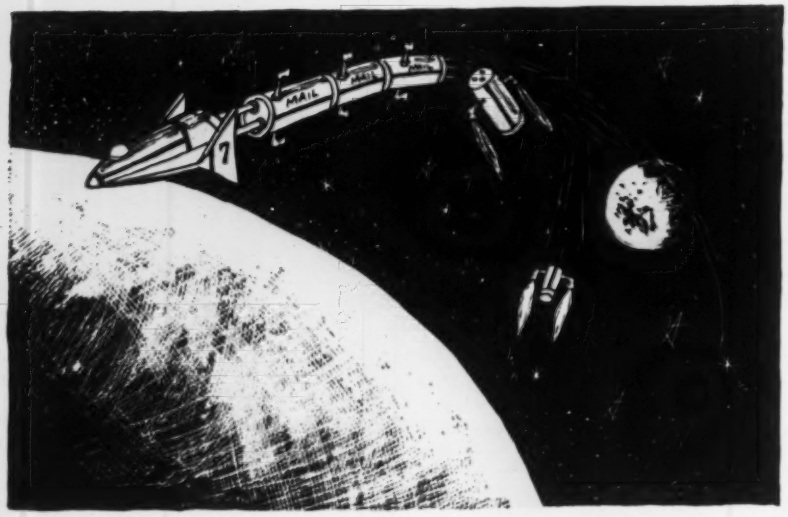
Crews would work from within the astrotug. Space ships would shuttle personnel and materials to the station.

Construction firms interested in Space Age work won't have to wait for future developments, however. There's plenty of construction about ready to start:

- The National Aeronautics and Space Administration's test station at Wallops Island, Va., will be expanded to handle satellite and high-altitude shoots. Plans are to fire eventually experimental Thor and Jupiter IRBM's from Wallops.

At least a half dozen new launching pads will be built. A $1.5-million project to build a 2.4-mile causeway is already under construction. Other support facilities probably will be added as they become needed.

- Work will start soon on the NASA's new Space Center at Beltsville, Md. Bids will be opened on March 17 for the initial construction. Some $3.5 million will be spent initially to build two laboratories, a temporary heating



Space vehicles may someday deliver the mail between major cities.

plant and other support buildings. The agency plans to make this eventually the nerve center of the space program. About 500 persons will be shifted there by next spring.

• Plans are to expand the minitrack network for satellites. Some 12 stations are already located around the world. NASA plans to spend $12 million this fiscal year to expand the network.

NASA also plans to build minitrack stations in Alaska, Newfoundland, Europe and the U. S. About $5.2 million will be spent to build a master tracking facility in southern Texas to be used in tracking manned flights.

• A new net of stations, dubbed Goldstone, is being set up. One station has recently been completed at Camp Irwin, Calif. Plans call for adding a station in Australia and one in Europe this year. Cost is estimated at $10 million each.* The government would eventually like to have from 40 to 50 of the stations located around the world.

• Chances are good that there will be an expansion of the military's new satellite-detection fence that has been set up across the southern U. S. There are now nine stations spread from Ft. Stewart, Ga., to San Diego, Calif., designed to detect enemy satellites that might be sent across the U. S. The program is still in the research and development stage, first operations having started last January. This is similar to the DEW Line radar net, which guards against enemy planes.

It all adds up to millions of dollars worth of construction work that is already near at hand. As the U. S. moves deeper into tapping the benefits of outer space, it will generate a need for more of the support facilities here on earth.

Space: What Construction Men Say

"When they design it, we'll build it. Give us a picture and show us what kind of rivets you want and we'll build that space station."

"Manned space stations are way over our heads just now. Any role for us will be way, way in the future."

"Construction companies as they now exist are not qualified to handle space construction. The average firm just doesn't have the scientific personnel. But some big companies, like our own, are getting ready."

"Small companies don't have a chance of getting into this kind of work; 95% of it will go to 5% of the people."

"There is a role here for construction people—but first they must realize they'll have an electronic as well as civil engineering responsibility."

"There will be very heavy competition between the construction firms and the missile and electronic firms for space contracts."

NSPE Delays 'Ambassador'; Defines Competitive Bid

Happily swamped under an embarrassment of riches, the National Society of Professional Engineers has postponed to later this month its choice of an engineering "ambassador."

NSPE decided on the delay at its recent meeting in Birmingham, Ala., when a last-minute flood of 2,000 applications—complete with resumes and cash—made it impossible for the Project Ambassador judges to review all the entries.

Project Ambassador is a fund-raising contest NSPE is using in its current campaign for financial contributions (ENR Nov. 6, 1958, p. 23).

Entrants have submitted resumes of their engineering experience along with contributions of at least one dollar for each year of professional registration. Starting with the resumes, the judges are expected to pick an "ambassador" to go abroad with his wife to visit engineers and engineering projects.

November 15 was the deadline for entries, but the judges couldn't handle them all by the February 19 award date.

• **Bidding definition**—NSPE's Committee on Ethical Practices presented a definition of "What Constitutes Competitive Bidding" by consulting engineers. The definition, adopted by the NSPE board, says:

"Competitive bidding for professional engineering services is defined as the formal or informal submission, or receipt, of verbal or written estimates of cost or proposals in terms of dollars, man-days of work required, percentage of construction cost, or any other measure of compensation whereby the prospective client may compare services on a price basis prior to the time that one engineer, or one engineering organization, has been selected for negotiations. The disclosure of recommended minimum or median fee schedules prepared by various engineering societies is not considered to constitute competitive bidding."

In other business, NSPE's board approved a change in the NSPE model registration law. The revision excludes land surveyors from registration as engineers. It also criticized pending labor legislation (see p. 91).

ENR Index Ready . . .

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Folded-Plate Concrete Roof . . .

. . . Collapses; Reason Unknown

A 150x42-ft section of precast concrete roof failed while under construction in Skokie, Ill., last month. Of 20 workmen in the area, three were injured slightly.

Exact cause of the failure has not yet been determined and probably will not be officially disclosed.

Most of the roof is a folded-plate design using pretensioned concrete members manufactured and erected by the Basalt Rock Co. Inc., Napa, Calif., under a subcontract. It is being constructed by the Barton-Malow Co., Detroit, for Parke, Davis & Co. as a regional office and warehouse.

The area that failed extends over two spans. One measures 90 ft; the other about 60 ft c-c of supporting reinforced concrete bents. The 90-ft span is in the main part of the 250x180-ft building. The other span covers a 60x52-ft loading area.

The 52-ft width of collapsed roof is made up of 10 lines of 3-in.-thick concrete slabs meeting at, and extending over, the interior bent. They are not continuous over the bent, but do have some negative reinforcement.

Over-all depth of roof is 4½ ft. Peak-to-peak spacing of the folds is 10½ ft, making a peak-to-valley spacing of 5 ft, 3 in. This results in almost a 45 deg angle for the 3-in.-thick slabs that make up the folded-plate roof.

Each 3-in. slab was prestressed with 17 high-tensile-strength strands, ⅜ in. in diameter. The strands were anchored by bond to the concrete.

• **Long spans**—Using the folded-plate prestressed concrete roof permitted long spans and resulted in large unobstructed floor areas. The roof over the main area is made up of two 90-ft spans extending over a central line of reinforced concrete columns spanned by a continuous reinforced concrete girder.

At the loading dock area a 52-ft width of the main folded-plate roof meets the 60-ft roof span, which extends to an exterior three-column reinforced concrete bent. This 52x60-ft area, together with the 52x90-ft area of roof on the other side of the central bent, is the portion that collapsed.

The outer ends of the 90-ft-span slabs dropped to the ground. The slabs weigh about 22.5 tons each. The other ends remained on their beam-and-column support.

At the same time the inner ends of the 60-ft-span slabs fell. These slabs weigh about nine tons each. Their outer ends were left leaning against the exterior three-column bent, which remained standing.

The outer ends of the ten 60-ft-span slabs, which weigh roughly 300 lb per lin ft, broke loose from their anchorages to the outer bent. The roof slab along one side of the loading area fell to the ground, but the nine other slabs remained leaning against the bent.

The impact of the blow, plus the dead weight of the nine slabs, knocked the three-column bent about 10 deg out of plumb, but did not push it over. Mute evidence of the terrific strain on both reinforcing steel and concrete is shown by the severely cracked concrete in the columns just above the footings.

From the evidence at hand it hardly seems possible that any settlement of footings of the exterior bent could have caused the failure. Tests have confirmed this point. One possibility is that the folded-plate roof slabs failed in bending or bearing at the central bent. Another possibility is that failure started in the negative steel over that bent.

Yamasaki & Associates are architects-engineers on the project. Harry Weese and Associates are resident architects. Ammann & Whitney is the structural consultant, but is not supervising the field work.

Centerline Must Be White On Federal-Aid Roads

First, Wyoming passed a bill requiring all its highway centerlines to be yellow, on the grounds that the color is easier to see in blizzards. Now another bill is being passed that would permit the state highway commission to waive the requirement for federal-aid highways.

Reason: U. S. Bureau of Public Roads says the centerline must be white or federal-aid money will be shut off.

BPR has adopted the American Association of State Highway Officials' manual on marking highways. It calls for white centerlines throughout the nation to maintain uniformity. If Wyoming wants to change colors, BPR says, then it must persuade AASHO to make yellow markings optional. Until that time, lines must be white.

Share of World Bank Work Down,

- **As World Bank loans for construction increase, U. S. firms are getting more dollar volume, but a smaller slice of the pie.**
- **Chief reason: Growing foreign competition. But some say U. S. construction firms may be pricing themselves out of the market.**
- **Engineering firms continue to increase both volume and share.**
- **Pattern: U. S. engineering, non-U. S. equipment and construction.**

The World Bank, leading single channel for financing of international construction, is almost certain to have its capital increased from $10 billion to $21 billion this year.

For the U. S., this means a 100% boost of $3.2 billion in its subscription. That would bring total U. S. dollar backing of the bank to $5.7 billion. President Eisenhower this month formally asked Congress to approve this increase and approval is virtually certain.

This move to increase the World Bank's resources reflects the increasingly important role the bank is playing in financing economic growth in underdeveloped countries. The bank's volume of lending has more than doubled in the past two years. It is expected to lend between $700 million and $1 billion a year for an indefinite period ahead.

The basic development projects financed by the bank—power, roads, ports, airports, steel mills, railroads—almost all involve large-scale construction (ENR Jan. 17, 1957, p. 21).

The fortunes of the World Bank and the trends in its lending operations are of key interest to the construction industry. Highlights of the outlook for the bank in the coming period are:

- **Volume of business will remain at present record-breaking levels or increase.**
- **The World Bank probably will undertake fewer major construction projects in the next couple of years than in the recent past, but it will finance a larger volume of smaller projects.** For the longer pull, some whopping new jobs are in prospect, notably for river development in Africa and southeast Asia.
- **World Bank lending will generate more business for the U. S. construction industry in absolute terms in the decade ahead.** But the relative share of U. S. firms probably will continue to shrink compared to foreign firms.

This last trend, which obviously is of key significance for American construction men, has become increasingly marked during the past four years. In 1955, more than 63% of all World Bank loans was spent in the U. S. for capital equipment and services. This percentage dropped to 50.5% in 1956, 44.3% in 1957, and 38.8% in 1958. The decline is likely to continue in the period immediately ahead, although probably at a slower rate.

The Germans and the British have been pushing the U. S. hardest for business generated by World Bank lending during this period, and Italy and Japan showed dramatic relative increases. The German share rose from 4% in 1955 to 17.2% in 1958, the British increased their take from 11.1% to 18.8%, the Italians and Japanese shares jumped from negligible percentages to 5.8% and 8.3% respectively.

Some contraction in the U. S. share in the booming business of international development was inevitable, of course, as the advanced industrial countries of Europe and Japan recovered from their war wounds.

But there is a nagging fear in Washington that some types of U. S. capital equipment and services may be pricing themselves progressively out of world markets under the pressure of cost inflation and, in some instances, overly complacent profit policies. The danger appears to be particularly acute for standard types of equipment or services where the U. S. has no clear technological lead.

It is clear U. S. construction firms are bound to face increasingly stiff foreign competition in the international development field from now on.

Many U. S. officials feel that if the U. S. firms are to hold their own they will have to sell their goods and services more aggressively abroad and in some cases tighten up on their cost and profit policies at home.

The sort of competitive pattern that is emerging shows up clearly in the record of recent World Bank operations. For example, the important trans-Andean cement plant, Cemento Pascamayo in Peru, for which the World Bank loaned $2.5 million, was built under a turnkey contract by Miag of Germany on the basis of an engineering survey by Knowles Associates. Miag subcontracted out the electrical work to the German firm of Siemans, and most of the civil work was done by a Peruvian firm. Increasingly in Latin America, U. S. or British firms will conduct engineering surveys on big World Bank projects, European firms will supply equipment, and local contractors will handle civil construction.

Approximately the same pattern showed up in the disbursement of the World Bank's recent loans to double the steel capacity of India's Tata Iron and Steel Company Ltd. Kaiser International did the engineering, but most of the equipment—the biggest single item of expense—was bought in Germany. Likewise, the Italian firm Impresit walked off with the $71-million civil works contract for the giant Kariba Dam in Rhodesia to the surprised dismay of British and American firms.

There are two consolations for U. S. firms in this competitive picture. The overwhelming majority of the engineering surveys involved in World Bank financed projects still are being done by U. S. and British consulting firms. This is likely to continue.

U. S. firms competing on World Bank projects are likely to be getting a smaller relative slice of a sufficiently larger pie, if present trends continue, so that they will come out ahead in absolute terms. The bank's lending generated about $280 million worth of business for American engineering and capital equipment companies last year, for example, compared to less than $240 million in 1955.

The annual rate of World Bank lending jumped from $388 million in fiscal 1957 to $711 million last fiscal year.

Volume Up

So far this year, lending is running at an annual rate of more than $800 million.

The proposed doubling of the bank's capital should make it possible for it to continue lending at this or higher rates for at least another decade without an additional transfusion of government capital.

Here's what the bank's loans have been used for. Roughly one-third of the outlays have gone for the development of power, one-third for development of transportation – including roads, railways, and ports–and the remaining one-third for industry–particularly steel plants–and for general development, including irrigation, land reclamation, sanitation, and various types of technical assistance.

This pattern of lending now appears unlikely to change in the decade ahead. It clearly adds up to big business for the construction industries of the more advanced countries.

Some of the major projects now under way or in prospect with assistance from the bank include:

• The Furnas hydroelectric power project in Brazil, largest hydro project ever undertaken in Latin America. The bank loaned $73 million last October to the joint private-public power firm, Central Electric de Furnas S.A., for the first stage of this project. The power station will be at Furnas Rapids on Brazil's Rio Grande and will have an ultimate capacity of 1.1 million kw, boosting the power capacity in south central Brazil by 50%. The earth-and-rock-fill dam will be nearly 400 ft high and will create a reservoir 150 miles long.

• The Yanhee multi-purpose river development on the Ping River in Thailand is under way with a $66-million loan from the World Bank for the first stage. This is one of the largest projects of its kind in Asia, with an initial power capacity of 140,000 kw and major flood control and irrigation facilities.

• The bank is expected to lend $50 million soon for the Senn nuclear power plant in southern Italy to be installed by General Electric. This is the bank's first venture into the nuclear power field.

• In India, the bank recently loaned $75 million for railroad development and a comparable additional sum for railroads and possibly other projects–may be forthcoming soon. A substantial loan also is under consideration for the big Konya thermal power project in India.

• Roughly $100 million has been loaned to Japan in the past year for steel, power, and other development projects. The loan is now being dispersed.

• The bank has loaned a total of $238 million so far for the development of southern Italy. This involves major construction of all sorts. Further large loans are likely.

• Major loans are under consideration for the development of Finland's forestry industry.

The future of the bank appears virtually unlimited. It will probably become involved in most of the major basic development programs undertaken in the free world in the decades ahead. Among them are likely to be such huge undertakings as development of the Mekong River (one of the largest rivers in the world, but not spanned by any man-made structure), development of the Nile, the Jordan, and other major river systems in Africa and the Middle East, the building of roads, ports, and other transportation facilities in virtually every underdeveloped country.

The World Bank's major "competitors" in the economic assistance field – the Export-Import Bank and the U.S. Development Loan Fund–spend considerably less for construction.

The World Bank has an engineering staff of roughly 30 experts organized in the technical operations department, one of the bank's five major divisions. Upon their expert opinion rests the bank's reputation for investing in sound projects.

WORLD BANK'S loan of $3.5 million will help El Salvador expand its biggest power plant, the "5 de Noviembre" plant on the Rio Lempa.

Tax Break for Self-Employed?

Chances are fairly bright for Congressional passage of legislation to give a tax break to self-employed persons who want to set up personal, private pension plans.

However, the Treasury Department is opposed to the idea and this could mean a Presidential veto.

Up to 10 million Americans have a stake in the measure, including many consulting engineers and architects and some contractors and homebuilders who are not salaried by a firm.

This is the legislative situation now: The House Ways and Means Committee has approved the idea. House passage is almost guaranteed. On the Senate side, there's less certainty, but some optimism.

The House passed such a bill last year, but it died in the Senate's Finance Committee, where chairman Harry F. Byrd (D., Va.) balked because (1) the bill came to him late, and (2) there wasn't time for hearings. Senator Byrd has been noncommittal, but the House is intent on acting early enough this year to deprive him of the same excuses if he tries to stop the bill again. It's a good guess that, ultimately, Senator Byrd will call hearings and the bill will be approved by the Finance Committee and then the Senate.

Here's how it would work:

- Self-employed persons could take tax deductions on amounts paid into personal retirement funds. The maximum limit would be $2,500 a year, or 10% of the individual's net earnings for a year, whichever is less.
- No further deduction would be allowed when an individual has deposited $50,000 in his retirement fund, or when he reaches age 70.

The House committee wants the plan to become effective this year, on 1958 income.

What about persons who are over 50? The bill's chief sponsors—Republican Reps. Eugene K. Keogh of New York and Richard M. Simpson of Pennsylvania—have a proviso intended to give them a chance to make the maximum deposits before they reach 70. For those who are 50 or older before January 1, 1959, the limit of their deduction—either as to percentage of net income or in actual dollar amounts—goes up one-tenth for each full year of age in excess of 50.

Thus, for example, if you were 55 before January 1 and you now want to start such a plan, you would be entitled to deductions for a private pension fund of either $3,750 or 15% of your 1958 net earnings—whichever is smaller.

Doctors and lawyers are putting on much of the pressure for adoption of such a system.

The most substantial opposition comes from the Treasury Department, which estimates that if the Keogh-Simpson bill is enacted this year it will cost the government up to $360 million in tax revenues on 1958 income.

The Treasury's position indicates that President Eisenhower will veto the measure if it comes to him—although he wouldn't have to rely on fiscal arguments. There is also some unorganized and potentially strong opposition on other grounds that is causing some Congressmen to squirm a bit. This is because the Keogh-Simpson approach is not broad enough to cover wage earners whose companies offer no pension plans.

Around the Country . . .

- **Dividing the Divide**—Colorado's State Highway Commission has approved a $296,200 contract with E. Lionel Pavlo Engineering Co., New York City, for the planning of a major east-west highway. Pavlo will decide whether the highway is to be carried over the Continental Divide or tunneled through it.

- **Atlanta coliseum**—Plans for a $20-million coliseum containing 350,000 sq ft of unobstructed floor area have been announced by the Southeastern Merchandise Mart, Inc., of Atlanta.

- **Bombproof doors**—A contract to design and develop doors capable of resisting high-yield nuclear blasts has been awarded to Mosler Safe Co. by the Corps of Engineers. The doors, to withstand impact forces over 9,000 tons, are part of a Corps program to develop standard devices for use in protective structures.

- **Louisville locks**—A $4.5-million contract to widen the Portland Canal from 200 to 500 ft at Lock and Dam 41 at Louisville, Ky., on the Ohio River has been awarded to Traylor Brothers, Evansville, Ind. The job is to be completed by mid-1961.

- **Airborne public works**—The Massachusetts Department of Public Works has bought a $48,000 helicopter for use in map making, emergency highway problems, appraisals and urban parking studies. The department estimates that purchase of the aircraft offers a potential saving of $218,000 in rent per year.

- **Stop that cloud**—Cornell scientists propose intercepting and seeding Buffalo-bound clouds over Lake Erie to net the city 18 more days of winter sunshine.

- **Defense job bidding**—In fiscal 1958, 92% of military construction contract awards (by dollar volume) was let through formal advertised bidding. The same level is anticipated for this year, the Defense Department says. Private negotiated contracting is conducted only in very rare case—for remote areas and for unusual requirements.

- **Detroit sewers**—Detroit voters have approved a $30-million bond issue to continue a storm sewer construction program begun three years ago. The city will spend the money at the rate of $10 million a year.

Baltimore County Plans First General Hospital

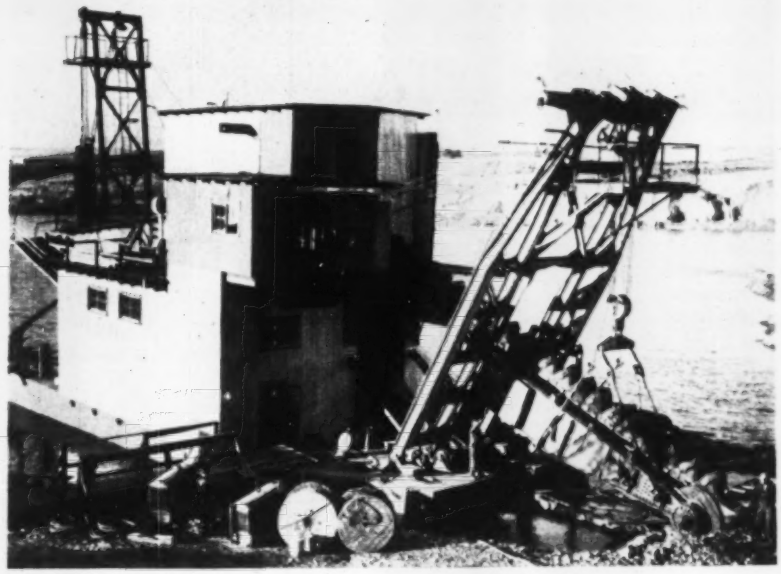
Plans for a seven-story, 300-bed general hospital, the first in Baltimore County, emphasize supply automation and individual patient care.

Supplies will be assembled in a central service area on the ground floor and dispatched to the other levels by a "trayveyor." Pneumatic tubes will carry records, medicines and small supplies. Other time and labor savers include push-bottom dumb waiters and a two-way intercom between nurses' stations and each bed.

There will be no wards in the hospital. All rooms will be the same size, for either private or semiprivate use. Each room will have toilet and bathing facilities.

In addition to the central structure, the $8-million project includes a nursing school, quarters for 100 nurses, an auditorium and living quarters for interns and physicians and parking facilities for the staff.

Architects for the project are Edward H. Glidden, Jr., and the firm of Cochran, Stephenson & Wing. The structural engineer is Ewell, Nelson & Bromhardt. Electrical and mechanical engineering is done by Henry Adams, Inc. All are Baltimore companies.



Gold Digger Still in Pay Dirt

A dredge that once brought up $750,000 worth of gold in two years from the bottom of the Palouse River in Idaho is now paying its way by digging ordinary dirt from the bottom of the Snake River in Washington. The craft is dredging a navigation channel downstream from Ice Harbor Dam, a Corps of Engineers multipurpose project near Pasco, Wash.

The job requires removal of 200,000 cu yd of material. It is part of a $29.5-million contract held by Montag Halvorson & Associates.

ACI Revising Concrete Standard

An extensive floor debate on a recommendation to revise the standard on concrete-mixing practice highlighted the 55th annual convention of the American Concrete Institute in Los Angeles last week.

The convention finally endorsed by a narrow margin the proposition that finish screening be provided at batch plants to control undersize aggregate. The recommendation will now be submitted to a mail vote of the entire membership for final approval.

Leading the fight for revision was Lewis H. Tuthill of the California Department of Water Resources, who was chairman of the committee that prepared the proposal. He was backed, in general, by ACI members representing specifying or construction agencies.

The opposition was led by former ACI president Stanton Walker, who is director of engineering for the National Sand and Gravel Association and the National Ready Mix Concrete Association. Most of his support came from members representing aggregate-producing or ready-mix firms.

They argued the provision would mean extra costs as high as a dollar a yard. Careful aggregate handling, they maintained, could minimize undersize aggregate without finish screening.

Mr. Tuthill estimated the cost increase at three cents a yard. He emphasized the importance of finish screening in concrete of uniform quality.

Finish screening would preferably consist of horizontally operating vibrating screens mounted directly over the batch plant bins. Ground level screening could be employed where necessary, provided the material is conveyed directly to the proper bin.

The convention also:

- Approved two other standards: one covering recommended practice for hot weather concreting, the other an addition to the recommended practice for proportioning concrete mixes covering structural lightweight concrete.
- Submitted a dues-increase measure to a mail vote. Dues of members would be raised from $15 to $20 a year, of contributing members from $100 to $135 a year, and of corporation members from $50 to $65.
- Elected Prof. Phil M. Ferguson, of the University of Texas, as the new president; Mr. Tuthill, vice president; and, as directors, Roger H. Corbetta of New York City, George O. Ernst of the University of Nebraska, E. A. Finney of Lansing, Mich., and Walter J. McCoy of Coplay, Pa.
- Awarded the Henry C. Turner Medal to Douglas E. Parsons of the National Bureau of Standards and the new Henry L. Kennedy Award to Joseph DiStasio, Sr.

Parkway Consultant Leslie Holleran Dies

Leslie Gilbert Holleran died at 77. He was a consulting engineer and former deputy commissioner of the Bronx Parkway Commission and the Westchester County Park Commission, New York.

Mr. Holleran was a partner in Clarke, Rapuano & Holleran from 1943 to 1951. He was chief engineer for the firm in connection with the development of the Van Wyck and Major Deegan Expressways in New York City. He also was consultant on the design and construction of Stuyvesant Town, Peter Cooper Village and Riverton Housing projects. Since his retirement he had served as a consulting engineer.

Mr. Holleran began his career in 1906 as an engineer with the New York City Board of Water Supply on construction of the Catskill Aqueduct. From 1914 to 1925 he was an engineer on the Bronx River Parkway. He received the Silver Medal of the New York Society of Arts and Sciences for this work.

From 1925 to 1933 he was deputy chief engineer of the Westchester County Park Commission.

Mr. Holleran was a 1906 graduate of Union College. He was president in 1950 of the American Institute of Consulting Engineers and also served as a director of the American Society of Civil Engineers.

Monorail System Deemed Feasible for New Orleans

A monorail transit system for New Orleans is feasible from both an economic and engineering standpoint. That's the opinion of Col. Sidney H. Bingham, former head of New York City's transit authority.

The opinion is based on a survey conducted by Colonel Bingham for Monorail of Louisiana, Inc. The firm was granted a franchise by the city last May contingent upon the outcome of a feasibility study.

The monorail system would cost $32.5 million to construct. It would operate at an annual profit of $3.7 million.

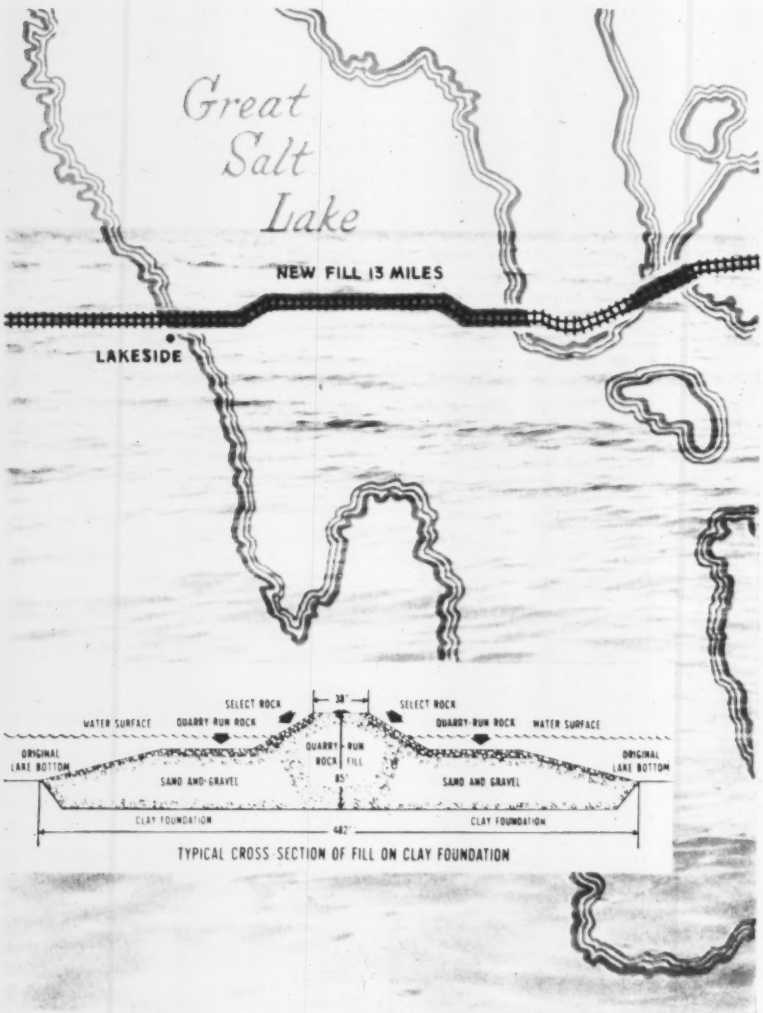
Originating in downtown New Orleans, the two-track system would go 16 miles to Moisant Airport. Travel time would be 26 minutes with a dozen stops en route.

The system would handle about 50,000 passengers a day, paying fares rising from 20 cents to 75 cents.

The report is endorsed by New Orleans' Mayor Morrison and the president of the City Council. The system could be operating by the end of 1960.

Southern Pacific bridges an inland sea

Great Salt Lake, Utah—Take a mountain of rock, sand and gravel—36,000,000 yd of it... stretch it 12.6 miles with the help of the world's biggest tractor shovels... then sink it 68 to 85 feet deep into Great Salt Lake. That's how the men of Morrison-Knudsen are building a new, solid-fill, deep-water, roadbed for Southern Pacific Railroad across Utah's great inland sea. Allis-Chalmers HD-21G tractor shovels play an important role in this gigantic undertaking.



TYPICAL CROSS SECTION OF FILL ON CLAY FOUNDATION

Multi-million dollar job passes halfway mark

The monumental job, scheduled to finish in 1959, triggered some of the largest non-atomic blasts in history to supply fill material. One blast powered by 2,138,000 pounds of explosives yielded 3,700,000 cu yd of broken rock.

Most of the fill is being placed by a fleet of eleven barges loaded by two methods. One is a spectacular two-mile conveyor system said to be the world's largest in terms of tonnage moved—4,000 to 4,200 tons per hour.

4-yd HD-21G's work ashore and afloat

The second method is by trucks that dump directly to barges. This fleet of 17-yd dump trucks moves constantly from stockpiles adjoining railroad tracks to the barges on a 20-hour a day schedule. Much of the truck loading is handled by Allis-Chalmers tractor shovels, only tractor shovels on the job.

With characteristic versatility, the tractor shovels are also able to board the barges and help place

A-C ALLIS-CHALMERS

...move ahead with ALLIS-CHALMERS...

Giant 225-hp Allis-Chalmers HD-21G tractor shovels handle their share of the fabulous 36,000,000 cu yd of fill going into the causeway. Production on the job has hit as high as 100,000 cu yd in a single day.

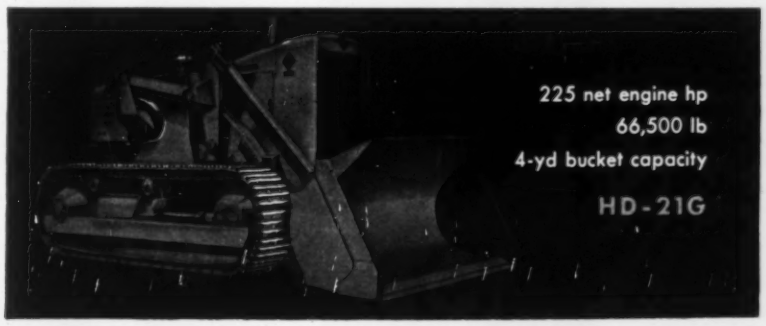
rock ballast on the causeway itself. If their loading ability is needed on the opposite shore, they are easily transported by barge or regularly-scheduled work train.

For a big job—big machines

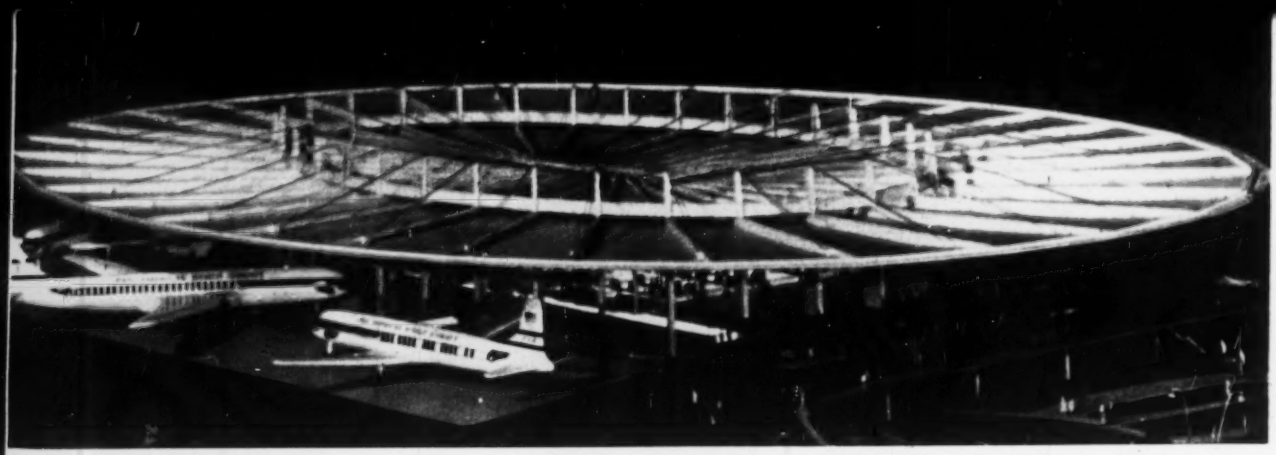
Men talk about the Salt Lake Causeway job in superlatives. Big machines moving tonnage at a record-breaking pace. And the HD-21G's on-the-job advantages match it all the way: the *highest* lift and the *longest* reach—with the *biggest* load. From ground level, the 4-yd bucket dumps handily up to 13 ft, 4 in.—high enough to clear the sides of the biggest haulers.

Morrison-Knudsen keeps close service records of each machine on the job. Service logs for the HD-21G's show they put in maximum time—offer top availability to keep producing.

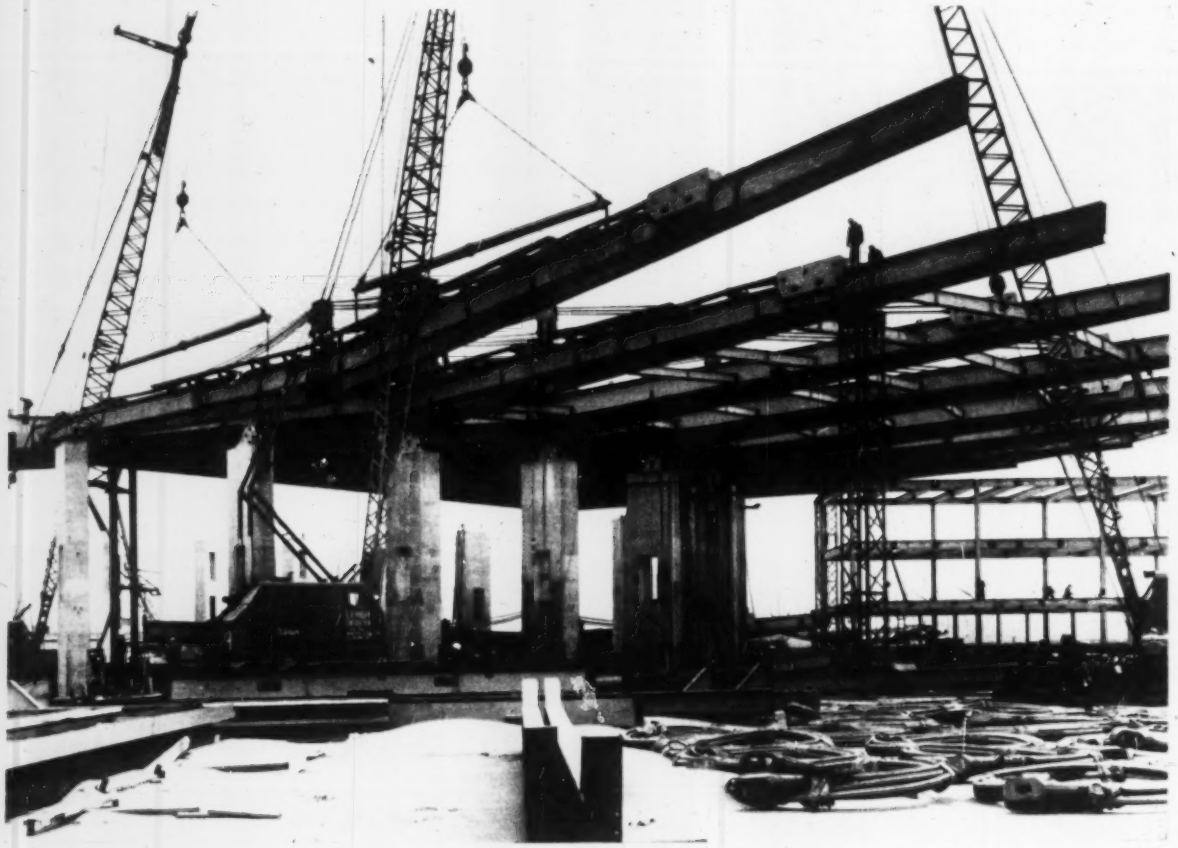
Here's actual proof on a heavy-duty tractor shovel operation that Allis-Chalmers maintenance and service cost is low—that you get more profit-making availability and production from your Allis-Chalmers equipment. Your Allis-Chalmers construction machinery dealer will demonstrate the size tractor shovel that fits *your* work—1½, 2¼, 3 or 4-yd capacity. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.



..power for a growing world



Pan-American jet terminal will be elliptical, with suspended roof overhanging planes.



During erection, cranes set girders with their 114-ft cantilever on a temporary support.

Terminal's Prestressed Steel Roof

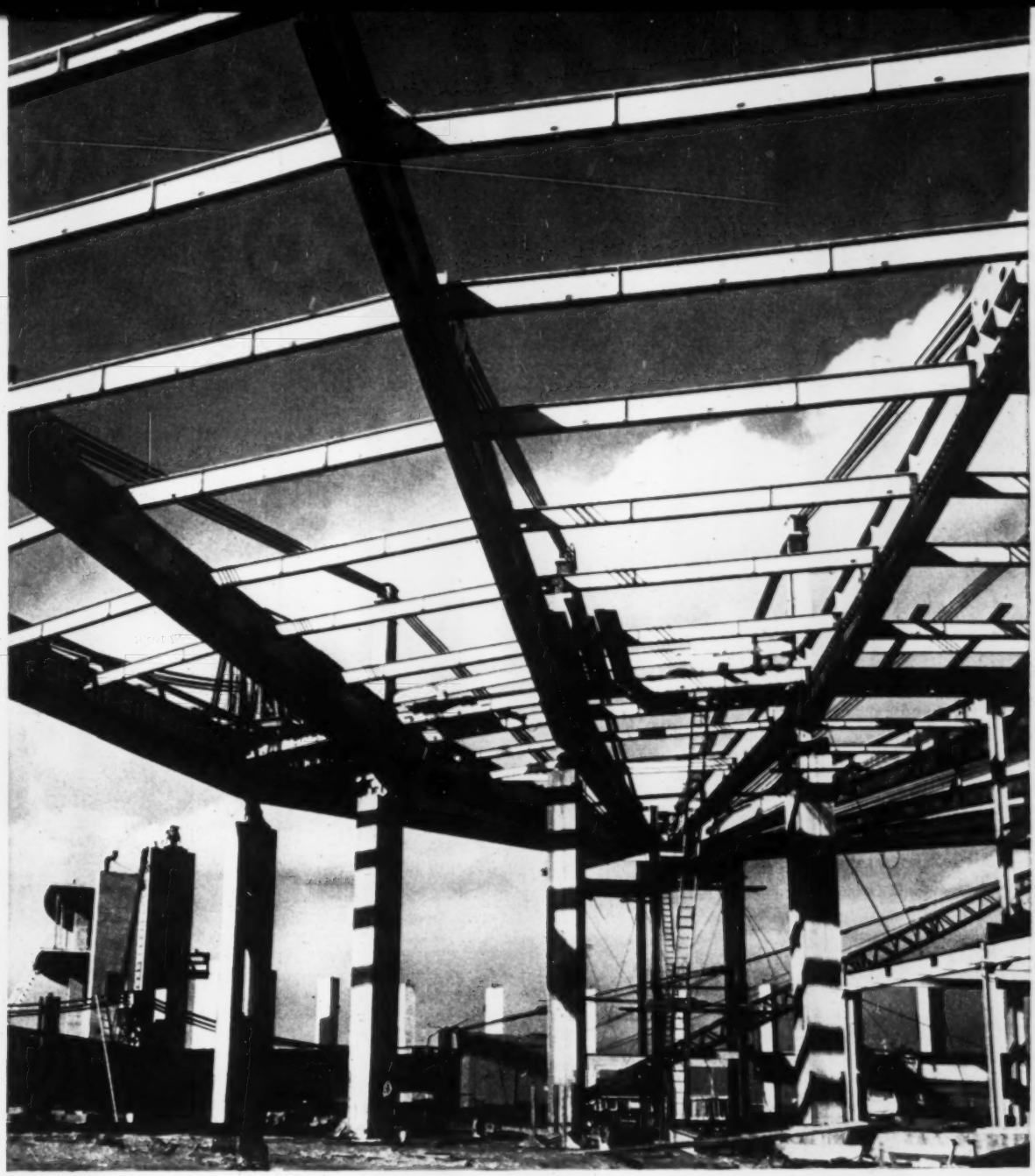
Zusse Levinton
Tippetts-Abbett-McCarthy-Stratton
Consulting Engineers
New York, N. Y.

Passengers will be able to board jet planes without leaving the shelter of the terminal roof when the unusual building above is completed.

The $8 million Pan-American Passenger Terminal, now under construction at New York International Airport, will be an elliptical-shaped building topped by an elliptical roof with a long overhang. The framing combines elements of suspension-bridge design with those ordinarily used for buildings.

The long overhang will shelter several jet planes around the periphery of the glass-enclosed building. The canopy projects 114 ft beyond the columns supporting the roof.

• **Steel girders prestressed**—Covering a 4-acre area, the roof has a 528-ft major axis and 422-ft minor axis. It is supported on two rings of vertical members. The outer ring, an ellipse 228 ft shorter than the roof, contains 32 columns. The inner ring, a hexagon at the center of the structure, has six tension members anchored to a heavy concrete foundation. These will hold down the roof against the uplift created by dead



After erection, the roof cables were tensioned, relieving the stress in the cantilevers.

Is Umbrella for Jet Passengers

and live loads that are imposed on the canopy.

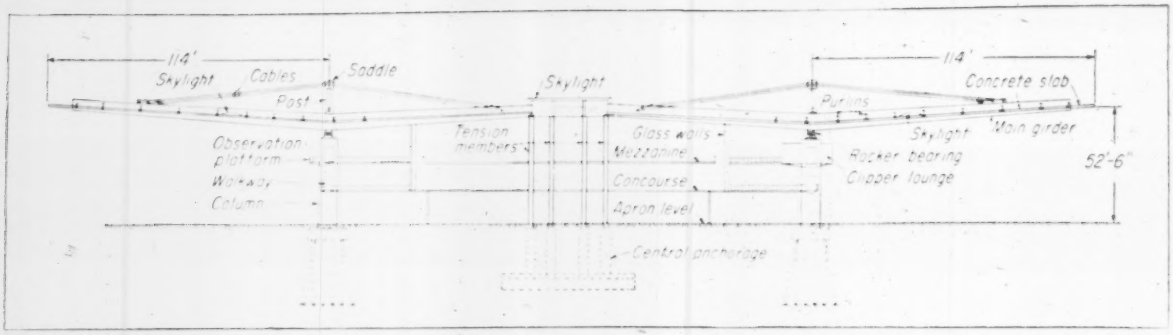
Main framing members of the roof are 32 welded steel girders. They are arranged radially, one over each column. At the center of the roof they frame into six girders connected to the six tension members. This hexagon also serves as a frame for a central skylight.

Each girder gets added support from six cables. These are attached to the outer end of the girder slung over a post atop the middle of the girder and tied back at the inner end (see p. 32). When the cables are tensioned, they apply both an uplift and a prestress to the girder. The eccentric force thus exerted reduces bending stresses due to the long cantilever.

Framed into the girders are wide-flange beams that support a lightweight concrete roof deck. These beams also carry the weight of mechanical and air-conditioning equipment located on the roof and serve as framing for a ring of skylights.

The concrete deck is covered with built-up roofing. Flashing made of a plastic was inserted at intersections with the steel framing.

The lower flanges of the steel members are encased in the concrete deck for fireproofing, but the webs and top



CANTILEVER ROOF is seated on concrete columns near midspan and anchored at the center with tension members. The glass-enclosed building is connected by bridges to walkways and observation platforms spanning between the columns.

flanges project above the roof. The steel above the slab is protected with paint.

The roof is sloped to form a valley over the column ring, and the main girders follow the slope. Openings are provided in the webs of the steel members for drainage. Water is expected to flow down the roof slopes to collecting drains embedded in the columns.

• **Walls free of roof**—Since the building is enclosed mostly with glass, the roof could not be permitted to bear on the walls. So sliding joints are provided between walls and roof, permitting the roof to deflect freely without transferring loads to the walls.

The central enclosure and its floor loads are carried on foundations separate from those supporting the roof.

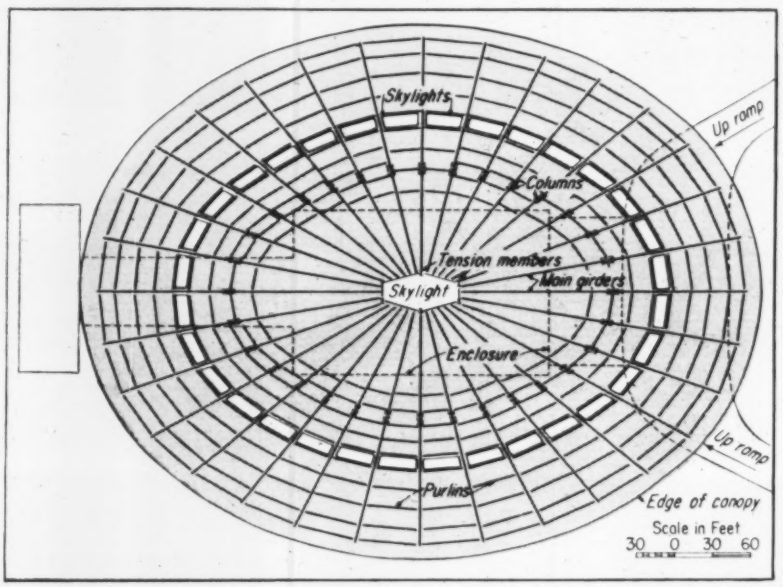
• **Like a suspension bridge**—The details of the suspended-roof design are as noteworthy as the over-all concept.

The main girders are tapered. Their depth varies from 7 ft at the columns to 4½ ft at the ends. Flanges range from 2 to 3 in. in thickness and webs from ½ to 1 in. Lengths of the girders vary from 186 to 224 ft; they were shop fabricated in three pieces and assembled in the field by making two welded splices. All heavy butt welding in the shop and field was radiographed.

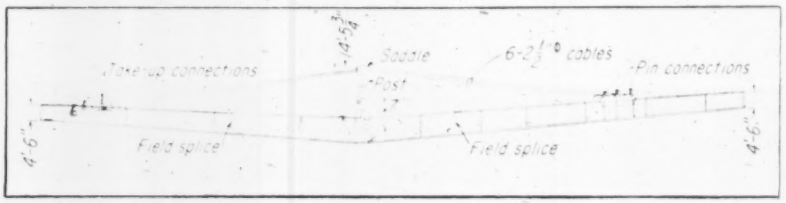
The cables are 2½-in.-dia bridge strand. They have a 376-ton minimum breaking strength and 24,000,000 psi modulus of elasticity. At the outer ends the cable sockets are pin-connected to the girder; at the inner ends they have a screw take-up connection for adjustment of length and initial tension in the cable. The saddles over the posts ride on a curved self-lubricating bearing for free adjustment of the cables.

The girder supports over the columns are bridge-type rockers. They permit thermal expansion and contraction of the roof in radial directions. Because of height limitation, a compact detail had to be developed. The result was a double rocker with a yoke—a novel type of rocker bearing.

The columns, made slender for esthetic reasons and pierced by openings for walkways, are heavily reinforced. Additional steel was embedded at the top to take the load from the girders. The columns rest on cast-in-place concrete piles. Other foundations are on timber piles.



ROOF FRAMING consists of 32 radial steel girders and purlins that span between them. Tops of these members extend above the concrete roof slab.



GIRDER AND CABLE assembly resembles a king post truss. Cables were tensioned by jacking up the saddle, then inserting the post.

• **Erection techniques**—The steel erector, Lehigh Structural Steel Co., Allentown, Pa., first set the columns and the central anchorage, next, its tension members and girder hexagon. The radial girders were assembled on staging on the ground and field splices were made. Temporary stiffening trusses were attached to the top flanges to prevent lateral buckling. Then cables were threaded through the saddles and connected to the girders.

The assemblies of girders and cables, without the posts, were lifted one at a time onto the piers and connected to the central anchorage.

Since prestressing of the girders was one of the most important considera

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BIG NEW CAT No. 14 TURBOCHARGED MOTOR GRADER

Most versatile big grader ever developed, recommended for everything from the roughest jobs to the finest grading!

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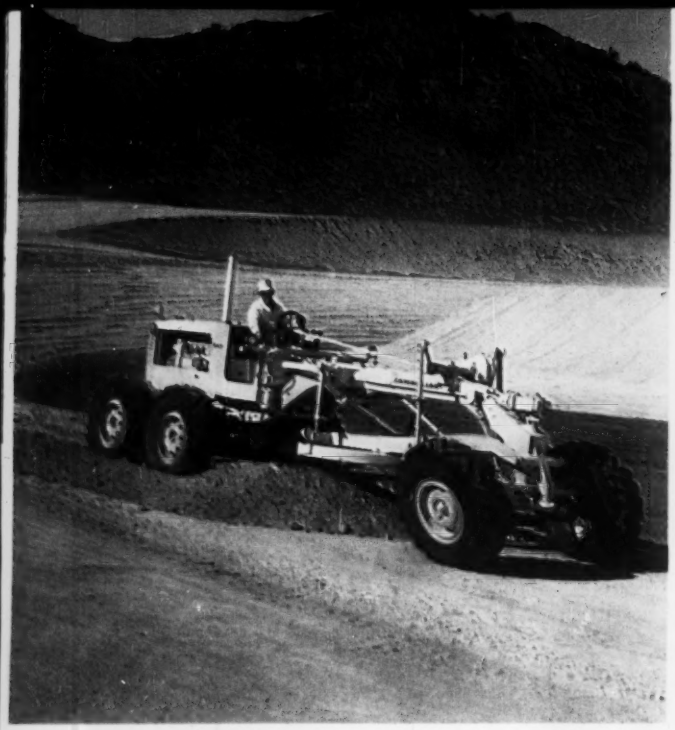
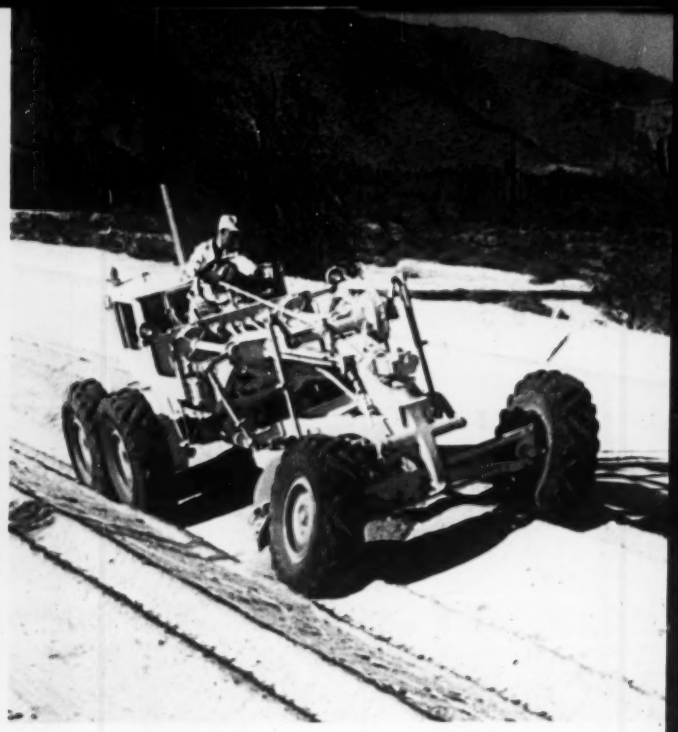


MAINTAINING HAUL ROADS, the No. 14 pays off with high capacity and high availability on the toughest construction jobs. It has the power to handle heavy material at speeds that won't interfere with hauling units!



DITCHING AND SPREADING, the No. 14 pays off with high production in this most demanding work. When working in fill areas, you can also use it to advantage spreading subbase and fill!

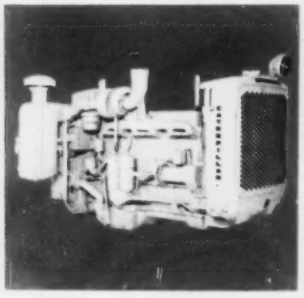
BIG, VERSATILE No. 14 PAYS OFF WITH

In the new No. 14 Series B, Caterpillar brings you the most versatile motor grader ever developed in the "big machine" field. It is the one big grader that delivers high capacity both on the roughest and finest grading work. Another major achievement in Caterpillar's "Project Paydirt," it answers the contractor's need for a unit that comes through dependably with higher, faster, lower-cost production on today's big jobs.

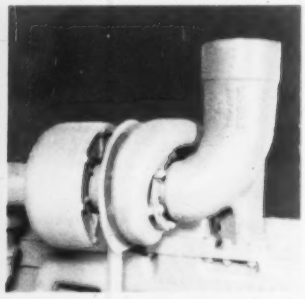
The first and only Turbocharged Motor Grader, the No. 14 packs 150 HP (rated at sea level). Weighs in the 30,000 lb. class. Operates at the highest practical working speeds with either a 12-ft. or 14-ft. moldboard. Has a turning radius of 36 ft. And with all this power and heft, it has the extra strength to deliver the high availability for which Cat Motor Graders are famous.

In the new No. 14 you'll find the latest engineering advances developed by Caterpillar research. Example: new design permits increased clearance between moldboard and circle for greater loads. You'll also find exclusive time-tested Caterpillar developments. Example: the oil clutch. All of these many features, some of which are listed here, pay off in this one fact:

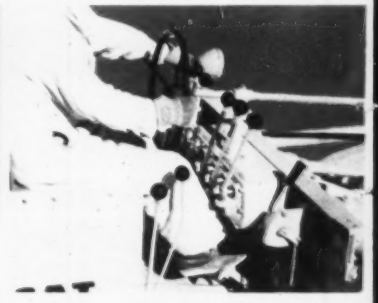
NEW DRY TYPE AIR CLEANER. Most efficient air cleaner ever developed. Removes 99.8% of all dirt from intake air during every service hour. Can be serviced in five minutes. Cuts maintenance time (by as much as 70%) and costs. Extends engine life.



TURBOCHARGED CAT ENGINE. First and only Turbocharged engine ever offered in a motor grader. Of job proven design, it is ruggedly built for a long life under severe working conditions. Like all Caterpillar Engines, its high torque rise (18%) pays off on the job.

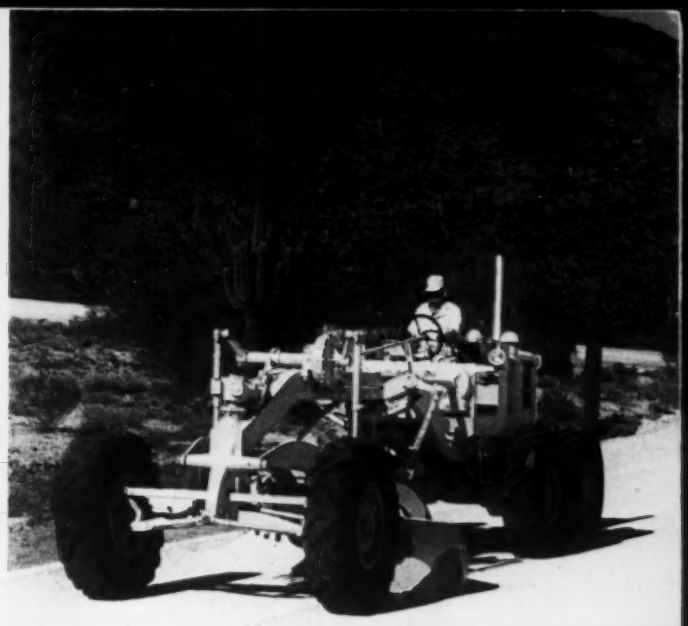


NEW TURBOCHARGER. Close-up of the Cat Turbocharger, which greatly increases over-all engine performance. Turbocharger utilizes waste energy from engine exhaust to step up efficiency and economy. Fuel system permits use of economy-type fuels without fouling.



IMPROVED MECHANICAL BLADE CONTROLS. Standard on the No. 14. Improved design increases speed of response 25%. Controls provide precise blade adjustment, reduce kickback, ease engagement. "Anti-creep" lock makes blade stay put under load.

BANK SLOPING. the No. 14's low center of gravity and broad 8-ft. base pay off in superior blading and machine stability. An operator can work with confidence on steep slopes ... and maintain high production on them!



FINISHING. the No. 14 pays off with maximum efficiency on fine or rough work. With the new transistorized Preco Automatic Blade Control, it controls blade slope within 1/8 in. in 10 ft. ... cuts fine grading time as much as 50%.

HIGH CAPACITY ON EVERY GRADING JOB

You can use the No. 14 profitably on many different applications such as:

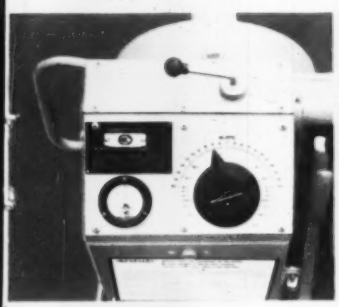
—power applications like heavy grading, heavy ditching, rough grading and bank sloping.

—control applications like light spreading, surface maintenance, fine grading and light blading.

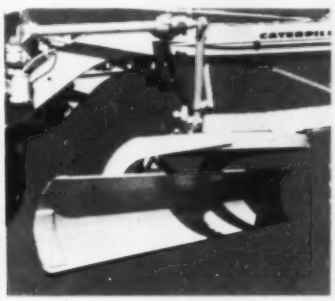
As a result, you don't have to pick "spots" to make the No. 14 pay off for you. This all-purpose grader will earn its keep on every application with high capacity and low operating cost. But see for yourself. Get the complete facts on the big new No. 14 from your Caterpillar Dealer. Go over it on his lot—watch it work on your job. Say when and where—he'll demonstrate!

NEW TURBOCHARGED No. 14

Engine HP	(rated at sea level)	150
Weight		29,280 lb.
Blade	Standard	12 ft.
	Optional	14 ft.
Tires (w/10-in. rims)		
All around		14.00-24 (10 ply rating)
Travel speeds: 6 forward, 2 reverse		2.6 to 21.6 MPH



PRECO AUTOMATIC BLADE CONTROL. Optional on the No. 14. Another exclusive! Operator selects desired slope on dial. Now transistorized for freedom from maintenance and adjustment, the unit automatically maintains blade slope within 1/8 in. in 10 ft.



AMPLE THROAT CLEARANCE. New design permits increased clearance between moldboard and circle for greater loads. Extra strength is built into frame, drawbar and circle to match engine power, absorb punishment of rough work and assure accurate blading in tough going.

14.00-24 TUBELESS TIRES. All way around—all tires mounted on 10-in. wide rims to stiffen tire side-walls and reduce tire "roll." Large tires on front end improve machine stability.

POWER STEERING AND POWER BRAKES. Both provide the fast, positive response that gives an operator complete confidence to tackle tough jobs. Ease of operation helps him maintain high production anywhere.

UNEQUALLED VISIBILITY. Dash-mounted lift gears and low frame design provide clear visibility. An operator, while seated, has an unobstructed view of critical areas at the front wheels, toe of the blade and circle. Convenient in-seat starting is another No. 14 plus.

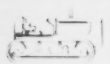
EXCLUSIVE OIL CLUTCH. Most advanced clutch design in the industry. Provides up to 2,000 hours' service without adjustment, the equivalent of about 12 months of "adjustment free" operation. Virtually eliminates down time for clutch repair.

PROJECT PAYDIRT

How Project Paydirt pays off across the board for you in the only complete earthmoving line!

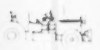
In the No. 14, you have just seen one of many achievements of Caterpillar's multi-million-dollar research program. This program is responsible not only for developing new machines like the No. 14, but also for improvements in every current model—Tractors, Scrapers, Traxcavators, Motor Graders and other earthmovers.

That's why, when you invest in a Caterpillar machine, you can count on it for unmatched performance in its class. It's a modern, heavy-duty unit that pays off where the chips are down—on the job. Here's the line-up at your Caterpillar Dealer to help you to more profitable earthmoving. Besides the No. 14, it includes the No. 12 and No. 112 Motor Graders and the following:



FIVE TRACK-TYPE TRACTORS: Spearheaded by the "take-charge" D9 (320 HP), there's the new D8 (225 HP), D7 (128 HP), D6 (93 HP) and D4 (63 HP). (All are flywheel ratings.) Plus a complete selection of 'dozers (including the No. 7G Bulldozer), rippers, tool bars and tool bar equipment.

THREE TRAXCAVATORS: These front-end loaders provide a range of capacities that meet every purpose—No. 977 ($2\frac{1}{4}$ cu. yd. bucket); No. 955 ($1\frac{1}{2}$ cu. yd.) and No. 933 (1 cu. yd.). All can be equipped with the exclusive Side Dump Bucket, or other quick-change attachments—special buckets, teeth, bulldozers or forks.



THREE WHEEL-TYPE TRACTORS: The two-wheeled DW21 (345 HP, max.), the four-wheeled DW20 (345 HP, max.) and DW15 (200 HP, max.) team with matching LOWBOWL Scrapers for high production: the No. 470 (19.5 cu. yd. struck), No. 482 (24 cu. yd. struck), No. 456 (19.5 cu. yd. struck) and No. 428 (13 cu. yd. struck) respectively. Four Cat 4-wheel Scrapers are also available: Nos. 491 (27 cu. yd.), 463 (18 cu. yd.), 435 (13 cu. yd.), and 60 (7 cu. yd.), all struck capacity. And Athey Wagons couple with Cat wheel-type Tractors for rear or bottom dumping.

Your Caterpillar Dealer is headquarters for the most productive earthmoving equipment line in the field. He's a source of reliable information and service. See him today!

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Diesel Engines • Tractors • Motor Graders • Earthmoving Equipment

BORN OF RESEARCH
PROVED IN THE FIELD

tions in the design, the method of erection and prestressing had to be worked out in detail. It had to take into account the variations in length of girders and cables and in dead load due to the weight of equipment located on the roof.

An individual design was made for each girder, including dead-load camber and amount of prestress, to insure that the outer rim of the roof remains in a horizontal plane under full dead load. The design provided for prestressing the girders either before or after erection. Lehigh chose the latter.

When several girders were in place, they were loosely connected with purlins. To prestress the first girder, the saddle was lifted by a crane and the slack taken out of the six cables. A special frame with jacks was then introduced. Next, the saddle was jacked up further, applying an initial tension to the cables. With the fabricated lengths of the cables predetermined, the tension was the same in all cables.

Lehigh continued jacking until the saddle was raised just enough to allow the post to be inserted under it. The lower end of the post was then welded to the girder.

The jacks were retracted slowly to deposit the saddle on top of the post, after which the saddle was bolted to it. Finally, the jack pressure was completely released, transferring the load to the post.

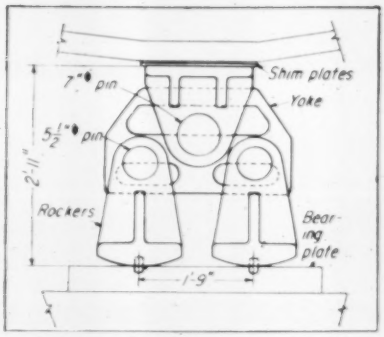
Prestress in the cables for the different girders varies from 40 to 50 tons per cable. The weight of the largest girder and cable assembly, including the temporary stiffening, is 75 tons.

For a final vertical adjustment of each girder, jacks pushed against the top of its column and shims were inserted or removed from the space between the lower flange of the girder and the rocker assembly.

• **Wind resistance**—Aerodynamic stability of the roof was an important consideration in the design. Studies were made to evaluate the maximum drag and lift on the roof due to winds of hurricane force. These involved determination of the natural modes of vibration of the structure and analysis for flutter and the vortex phenomenon.

These studies showed that the critical wind velocity for flutter is well above the design velocity of 150 mph that the structure will encounter. They also indicated that for lower velocities for which the possibility of vortex formation was considered, no unusual wind effects are likely to occur.

However, the design calls for the outer two rows of purlins to be rigidly connected to the girders, to form a horizontal stiff ring for increased resistance against flutter. The concrete rim of the canopy is rounded and streamlined, as an added precaution against vortex formation.



DOUBLE ROCKER provides a large bearing area, good load distribution.

• **See-through design**—To maintain the general impression of airiness and transparency throughout the building, the designers devised special structural shapes for the steel framing. Steel mullions supporting the plate glass walls are made up of denticulated tees welded to pipes.

The suspended walkways are concrete slabs cast into welded steel frames with thin edges. Some platforms have railings that also serve as supporting trusses.

The main entrance to the enclosed building at the concourse level is an opening 90 ft long by 10 ft high. In lieu of conventional doors, the entrance has an air curtain, the largest known installation of its kind. Warm air in the winter and cool air in the summer will be blown down across the opening from a blower and duct system on the roof and return through floor gratings and ducts under the floor.

The framing of the opening was accomplished with light tubular members and cable hangers for least structural bulk and minimum obstruction of transparency of the facade. A glass screen in front of the entrance protects the air curtain from direct winds. Movable panels are provided for closing the entrance fully, or in part, for high winds or other emergencies.

In front of the building there is a row of large sculptures representing the twelve signs of the zodiac. Here the structural framing merges into unity with the figures, symbols and stellar designs of the sculptures.

Tippetts-Abbett-McCarthy-Stratton are the architects-engineers, with Ives, Turano and Gardner as associate architects. Aerodynamic studies of the roof were made by Gruen Applied Science Laboratories, Inc. Turner Construction Co. is the general contractor. All are New York City firms. General development of New York International Airport is under the jurisdiction of the Port of New York Authority.

4-D

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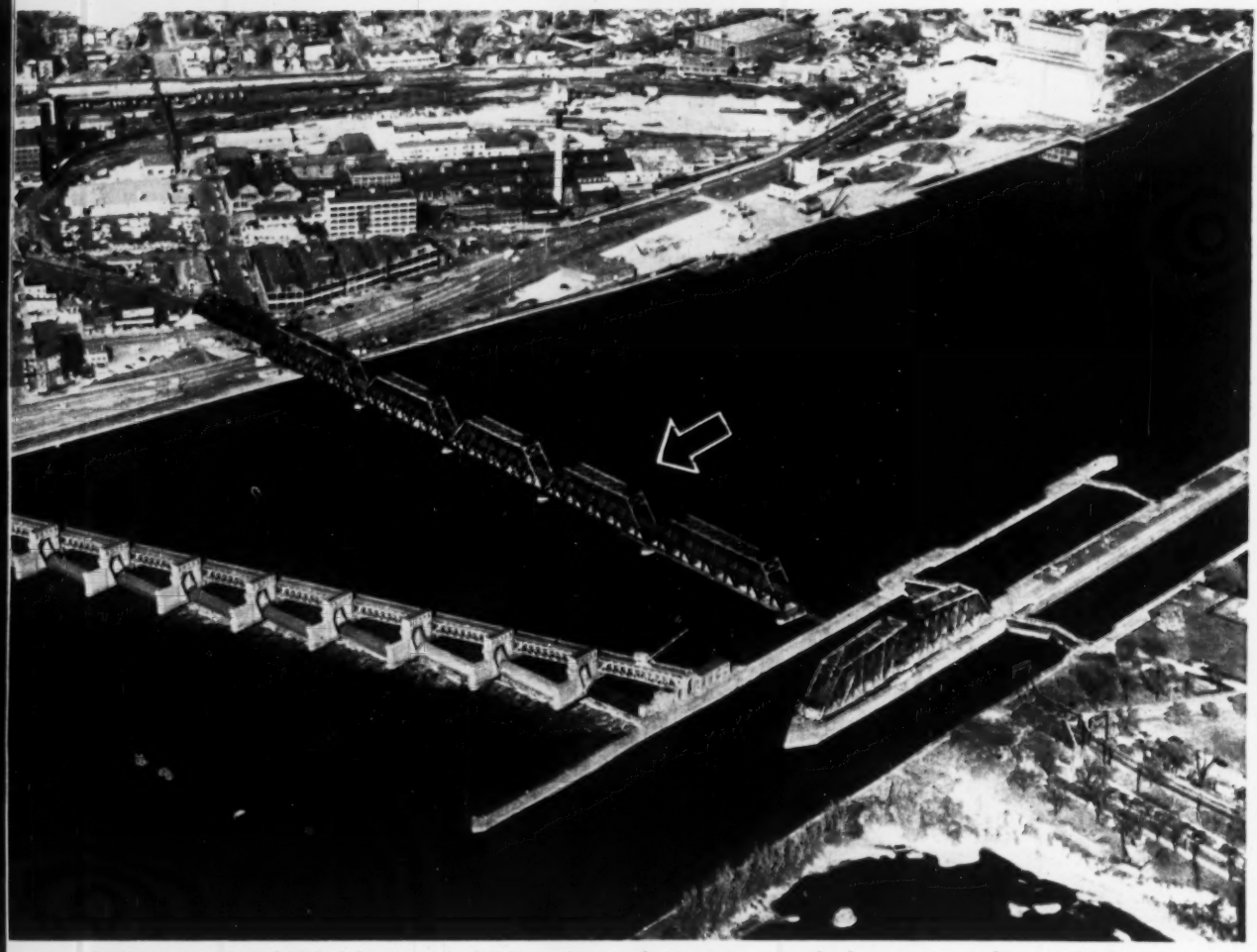


During repairs this bridge carried 30 trains a day on upper deck, autos on lower deck . . .

Sixty-Year-Old Bridge Gets a

Mahlon J. Plumb
Plumb, Tuckett and Pikarsky
Chicago

"Spidering" of joints and reboring of holes permitted replacement of 30 worn pins on a 60-year-old bridge over the Mississippi River at Davenport, Iowa.

The work was part of a $1.7-million modernization program that included: strengthening all end posts and top chords; replacing the top lateral bracing system; strengthening all highway stringers and floor beams; replacing the timber roadway and sidewalks with steel grid.

Final construction—to make a "swing span" revolve a full 360 deg—will be completed this spring.

All construction had to be carried out without interrupting train traffic across the bridge or river traffic through the swing span.

The eight-span structure is 1,850 ft long. It carries a 24-ft-wide highway below the double-track main line of the Chicago, Rock Island and Pacific Railroad.

• **Falsework support**—To prevent the pin-connected spans from collapsing when the worn pins were removed, the spans were supported temporarily on falsework towers placed in the river. Each tower consisted of four steel H piles about 32 ft long. They were framed together at the top with steel beams that carried jacks. A double acting hammer drove the piles a few inches into the rock bottom of the river.

The spans were jacked from the falsework towers to relieve the dead load stresses in the truss members.

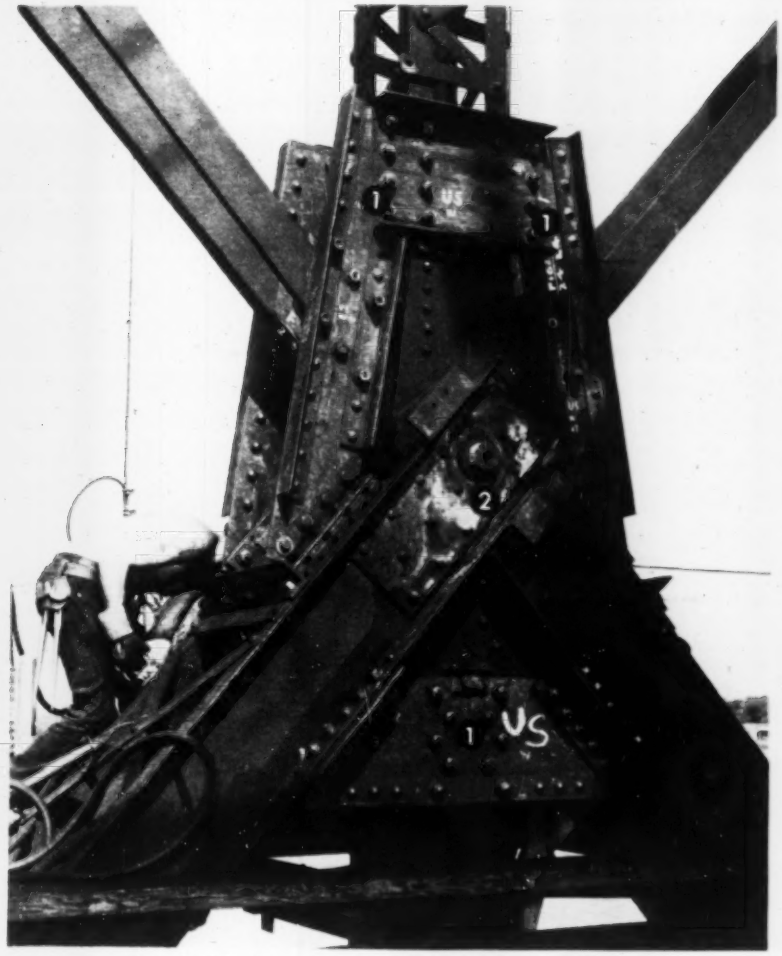
• **Spidering**—An unusual structural framework, called "spidering," was erected around each joint where a pin was to be replaced.

Pieces of channels, plates and angles forming the spidering were designed as a sectionalized gusset plate to hold all truss members in proper position during reboring. Six bolts clamped each eyebar. Other bolts connected the spidering to holes in the other truss members.

All temporary and permanent field connections, including those for spidering, were made with high strength bolts. They were tightened to a minimum tension of 80,000 lb per sq in.

The spidering bolts were left loose during jacking and centering operations. The span was jacked to no load position during a slack period between train movements on the bridge. Before removing any pins, trains were allowed to cross the span to prove out the falsework's stability.

After again stopping all traffic, workmen made a final centering adjustment by wedging and shimming truss mem-



Spidering (1) held truss members during pin (2) replacement.

New Set of Pins

bers at the pin and raising or lowering jacks. They then tightened all spidering bolts, removed the old pin by burning it into pieces and started the reboring.

• **Special boring machine**—Pins removed had worn as much as 0.5 in., and the pin holes had been enlarged.

A special machine bored the holes larger. The machine's electric motor, acting through a gear train, rotated the 6-ft-long, 2.5-in.-dia bar. A hand wheel on one end of the bar advanced the cutting tool along the hole. At both ends of the hole a cross-head plate, with an adjustable bearing for centering and holding the bar, was bolted to clip angles on a truss member.

The finishing cut provided a maximum clearance of $\frac{3}{32}$ in. over the new pin diameter. Diameters of the new pins varied from 6.5 to 10 in. and replaced old 6-in. to 9-in. pins.

A slight rescheduling of one train provided a 6-hr work day for the actual reboring. Sometimes a reboring operation could not be finished in one day and had to be discontinued overnight to permit traffic on the bridge. When this happened complete safety was assured for the trains by inserting a temporary pin in the partially rebored hole.

By using two complete sets of spidering for each type of hole rebored and three complete sets of boring bar equipment for the whole bridge, workmen were able to prepare other holes in advance while insuring against lost time due to broken equipment.

• **Eyebars adjusted**—After reboring the worn pin holes, the contractor tightened those main truss eyebars that had become loose enough over the years to be partially or totally inactive. Of the bridge's 344 eyebars, 53 were loose, causing over-stresses in other truss members. Forty-four of these bars were readily adjusted by turning their turnbuckles.

The remaining nine loose eyebars, having no turnbuckles, were adjusted by using a flame shortening process. A 12-in. length of each bar was heated to about 1,600 deg F. with acetylene torches. Clamp plates gripping the eyebar on both sides of the heated zone were then drawn together by tension rods to upset the heated area slightly. Upon cooling, the eyebar was bearing tightly on the pins at each end.

• **Span moved**—The repair program included remedy of an increasingly serious condition at the juncture of the swing span and the adjacent shore span. During hot weather it had become difficult to open and close the swing span properly because the shore span had moved and was binding at the railroad deck.

Temporary emergency measures had consisted of burning off a part of the railroad deck at one end of the swing span to provide better clearance.

This condition, traced to capstones slipping in the abutment, was corrected by jacking the span 2.5 in. back to its original position. First the span had to be raised, using the falsework erected earlier for reboring, to permit shifting the truss shoes on the abutment. At the same time the abutment masonry was strengthened by pressure grouting through new anchor bolt holes. Horizontal force was then applied by jacks and jacking posts inclined 45 deg to the horizontal under the span.

• **Power lines de-energized**—While span No. 1 was being moved, or when repairs required working near any of the transmission towers on top of the bridge, the contractor arranged with the power company to de-energize six overhead 13,000-volt transmission lines.

• **Design and supervision**—Modjeski and Masters, Harrisburg, Pa., whose founder, Ralph Modjeski, designed the bridge in 1895, inspected the structure and prepared design plans and specifications for the repairs. The work was performed for the Corps of Engineers, under the direction of Col. John B. W. Corey, Jr., district engineer, Chicago. The Rock Island Railroad was represented by W. B. Throckmorton, chief engineer.

Plumb, Tuckett and Pikarsky designed the falsework and spidering schemes, and prepared erection drawings.

The F. K. Ketler Co., Chicago, was the general contractor, and J. F. McCook was project engineer. H. E. Eckhoff was resident engineer for Modjeski and Masters and represented the Corps of Engineers and the Rock Island Railroad.

On the Illinois Toll Highways—every

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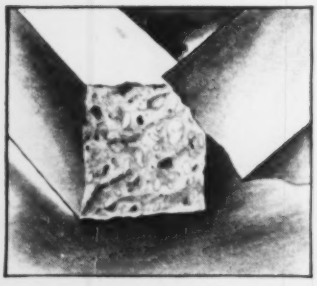
PORTLAND CEMENT



Fracture test demonstrates concrete's unequalled bond strength. Cement binder holds so tightly that break is through the aggregate itself. In contrast, binder in flexible pavement loses its grip, break occurs *around* the aggregate.

mile in CONCRETE

50 years' life and more . . . maintenance costs up to 60% lower than for flexible pavement . . . this is what Illinois can expect on these vital new concrete tollways.

187 more miles of concrete for Illinois—one of America's heaviest traffic states! Behind the choice was Illinois' experience with concrete on 11,600 miles of highways. Efficient, low-cost performance comes from the very nature of concrete. One example of this: concrete can't oxidize . . . there is never any adverse chemical reaction to sun, cold, air or moisture. So it doesn't dry out, lose strength and need expensive surface build-up treatments every few years. In fact, concrete actually gains strength—up to 20% in 5 years.

Add superb riding smoothness—and it's easy to see why modern concrete is the preferred pavement for Interstate highways and other heavy-duty roads.

ASSOCIATION *A national organization to improve and extend the uses of concrete*

FOR HIGHWAYS WITH A SOLID FUTURE . . .

Concrete

Workers hand-placed rock along basin slope . . .

. . . then grouted it.

Asphalt seal was tamped . . .

. . . and excess soil carried away in buckets.

Will Jamaica's Mona Reservoir

Engineers have tried for the third time to make a controversial 700-million-gallon reservoir in Jamaica hold water—but new cracks have developed in the reservoir floor.

The jinxed water storage catchment for Kingston, Jamaica, has already cost well over $2 million.

Final steps in the latest effort were carried out while the reservoir filled. Workmen rushing to complete the final sealing of the one natural side—Long Mountain slope—were working just ahead of the rising water.

But new cracks came even while this work was in progress.

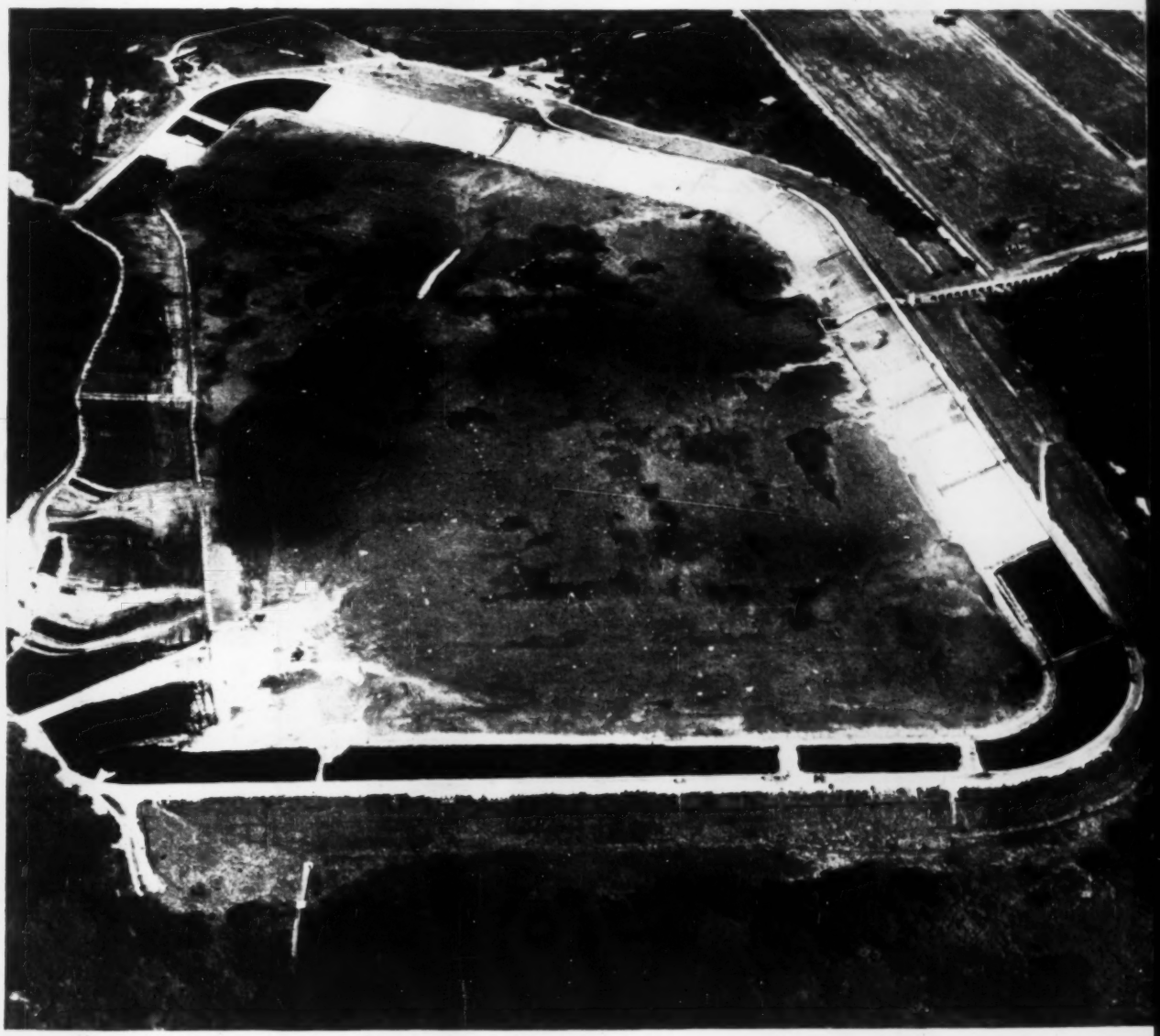
W. Kirkpatrick, chief engineer of the Water Commission, reported that five cracks and 10 crater-shaped depressions had been found in the bottom, penetrating a clay blanket laid in 1955. He said there was no satisfactory explanation.

The cracks, 20 to 70 ft long and 3 to 5 ft deep, were dug out; a soil binder (tetra-sodium-pyro-phosphate) was injected into the bottom; and layers of clay filled the rest.

Planning for the basin dates back to 1939 when the proposal to build it was made by the then chief engineer of the commission, William M. Thyne. The idea was considered sound and approved.

The original construction was started by the Public Works Department in 1942 and completed in 1946. The structure was described as "a magnificent piece of work." The stone revetment and concrete work is said to be unsurpassed in any part of the West Indies.

The reservoir was not completely



Now for the third time, the reservoir is ready, ,but . . .

Hold Water?

filled until June 1948. Then it was discovered the catchment leaked. Some 6 to 7 million gallons a day seeped away.

The following year, amidst heavy water losses and public indignation, the government asked Guy H. Humphreys, an English engineer, to inspect the reservoir.

Mr. Humphreys' findings indicated the reservoir rested on the site of the ancient Hope River. The floor of the reservoir should therefore have been specially treated.

Plans had provided for this work, the report noted, but the work had never been incorporated in the job.

To stop the leakage from the reservoir bottom, the inspecting engineers recommended that experimental studies be made at an estimated cost of $150,000 to $300,000.

Publication of the report caused concern in both government and private circles. Councilor William Seivright, then a member of the Water Commission and now Minister of Agriculture, said the reservoir "is best written off as a dead loss." A leading politicians suggested it be converted into a national stadium.

The government, however, formed a committee headed by Sir Johnathon Davidson of England to assess the report. The Davidson report, released in 1951, said the reservoir could be made watertight but it would cost about $250,000.

It was not until May of 1952 that the Humphreys firm began making tests on the bottom. Then too, William Lambe, for the consulting firm of A. D. Little, Inc., said a 2-ft-thick impervious blanket of clay should have been laid on the bottom.

A contract was finally let in 1955 to John Mowlem and Co. through its sub-

PAYLOADER® versatility

with "4-in-1" bucket

By teaming the patented Drott bucket with the rubber-tired traction and power of a 4-wheel-drive PAYLOADER, you have an unmatched combination of on-job mobility and workability. Without spending a minute's time changing equipment, the hydraulically controlled split bucket can be adjusted to perform shovel, clamshell, scraper and bulldozer operations.

No other tractor-shovel comes close to matching the wide selection of interchangeable attachments available for a 4-wheel-drive PAYLOADER — real working tools that *save time* on-the-job and the *high cost* of special one-purpose machines.

A dependable PAYLOADER can be the key machine in new construction, repair or maintenance work. Big rubber tires permit it to walk and work over sidewalks and curbs without damage. It travels under its own power, gets to where it is needed *fast*, without having to rely on a trailer or truck for transport, and handles many scattered jobs in a single day to multiply its versatility even more. See your nearby Hough Distributor for more complete details.

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3-B-2

Title
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State

sidiary, Soil Mechanics Ltd., to lay a clay blanket on the 75 acre bottom.

The work was completed at a cost of $400,000, and the reservoir was again completely filled in 1956. Measurements indicated seepage had been reduced by 50%, but the reservoir still leaked so badly it could not be used.

With the catchment still useless for water storage, engineers sunk 20 to 25 bore holes all around the reservoir to a depth of 40 ft to determine where the seepage was coming from.

After examining the results, they decided to seal the sides of the reservoir. A contract for sealing was let to Associated Engineers, a Jamaican company.

The artificial sides of the reservoir—stone masonry—were sealed by grouting the stonework with a crushed limestone-cement mixture, spraying the mixture with light asphalt solution, and then covering with a heavy seal coat of asphalt ½ to ¾ in. thick.

On the one natural side—a slope of Long Mountain—asphalt was mixed with a 2-in. layer of sand and gravel and a 1-in. layer of crushed limestone. The stabilized slope was then rolled and a final seal coat of asphalt was put down.

Now all concerned are waiting to see if the reservoir will at last hold water.

Face-Lift Old Port

$13-million renovation begun on oldest harbor

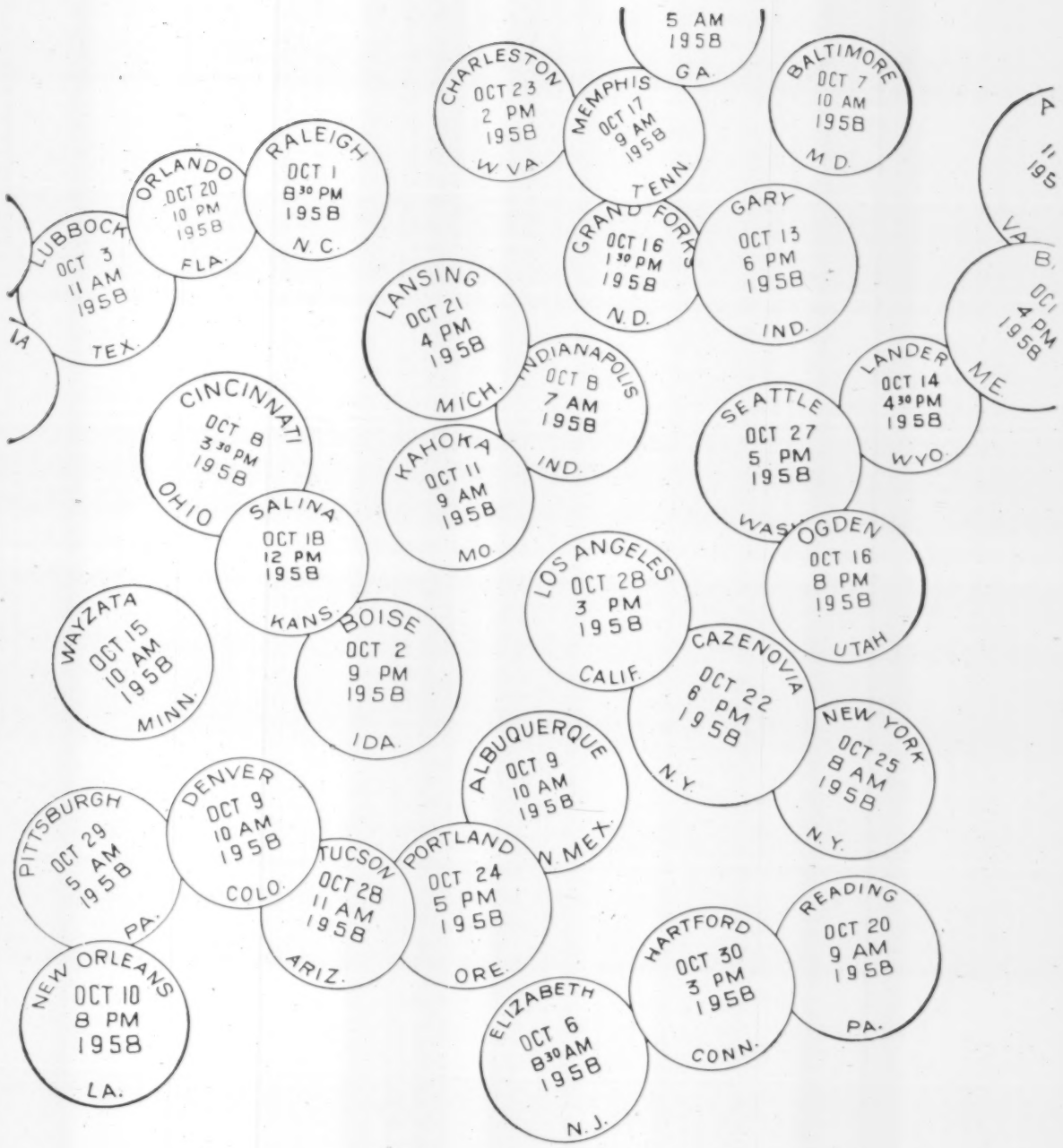
First contracts are out for reconstruction of what is probably North America's oldest harbor, at St. John's, Newfoundland, the first established city of the New World.

The modernization scheme is set at $13 million and includes:

- Building a large finger wharf and adjacent marginal wharf, with rail connections to Canadian National Railways.
- Putting in about 2,300 ft of marginal wharves along the north shore of the harbor.
- Constructing a 617-ft-long marginal wharf (a $547,000 contract for the job was recently awarded to Trynor Construction Co., Ltd., Halifax).
- Demolition of existing wharves and construction of a new four-lane access road on the north side of the harbor.
- Building new access roads along the south shore.

The 7,000-ft-long, world-famous harbor now handles about 800,000 tons of cargo a year. The modernization is expected to increase this by 250,000 tons.

The plan was drawn up by Foundation of Canada Engineering Corp., Ltd. Builder is the Canadian Federal Department of Public Works.


5 AM 1958 GA.
CHARLESTON OCT 23 2 PM 1958 W VA
MEMPHIS OCT 17 9 AM 1958 TENN.
BALTIMORE OCT 7 10 AM 1958 MD.
RALEIGH OCT 1 8 30 PM 1958 N.C.
ORLANDO OCT 20 10 PM 1958 FLA.
LUBBOCK OCT 3 11 AM 1958 TEX.
GRAND FORKS OCT 16 1 30 PM 1958 N.D.
GARY OCT 13 6 PM 1958 IND.
LANSING OCT 21 4 PM 1958 MICH.
INDIANAPOLIS OCT 8 7 AM 1958 IND.
CINCINNATI OCT 8 3 30 PM 1958 OHIO
KAHOKA OCT 11 9 AM 1958 MO.
SALINA OCT 18 12 PM 1958 KANS.
SEATTLE OCT 27 5 PM 1958
LANDER OCT 14 4 30 PM 1958 WYO.
OGDEN OCT 16 8 PM 1958 UTAH
LOS ANGELES OCT 28 3 PM 1958 CALIF.
WAYZATA OCT 15 10 AM 1958 MINN.
BOISE OCT 2 9 PM 1958 IDA.
CAZENOVIA OCT 22 6 PM 1958 N.Y.
NEW YORK OCT 25 8 AM 1958 N.Y.
ALBUQUERQUE OCT 9 10 AM 1958 N. MEX.
DENVER OCT 9 10 AM 1958 COLO.
PITTSBURGH OCT 29 5 AM 1958 PA.
TUCSON OCT 28 11 AM 1958 ARIZ.
PORTLAND OCT 24 5 PM 1958 ORE.
READING OCT 20 9 AM 1958 PA.
HARTFORD OCT 30 3 PM 1958 CONN.
NEW ORLEANS OCT 10 8 PM 1958 LA.
ELIZABETH OCT 6 8 30 AM 1958 N.J.

From all over the U. S. A., engineers wrote in to say...

"HERE'S WHY I PREFER CAST

A country-wide survey of consulting engineers, recently completed, asked this question: *What kind of pipe do you prefer for water distribution, and why?* Of the answers received, by far the greatest number named cast iron! Here are typical comments:

"Adequate factor of safety in practice to resist water hammer, heaving, heavy live loads. Ease of joint connections. Reliability in past service."

—Iowa

"Long service and favorable price of installation with least trouble from breaks and other maintenance problems."

—Virginia

"More satisfactory and tighter connections. Easier to make adjustments if actual measurements and fittings do not correspond with plans or if changes are made along the way."

—Illinois

IRON PIPE"

"1. Durability. 2. Uniform quality of installation, regardless of contractor's ability."

—Georgia

"Cast iron, being more physically rugged, can be installed with less supervision and less chance of subsequent failure due to improper bedding or loading conditions."

—Massachusetts

Three reasons why cast iron pipe is America's greatest water carrier:

1. More miles of underground cast iron water mains are now in use than of all other kinds of pipe combined.

2. More miles of cast iron water mains are now being purchased and laid than of any other kind of pipe.

3. Impartial surveys prove that today's water utility officials and consulting engineers prefer cast iron pipe for underground water distribution by an overwhelming majority.

. . . good reasons for you to choose

CAST IRON PIPE

Cast Iron Pipe Research Association, Thos. F. Wolfe
Managing Director, 3440 Prudential Plaza, Chicago 1, Ill.

Over two tons of stump and dirt, yet the International® Drott TD-9 4-in-1 "clams" on to this unwieldy load, and easily lifts it for loading on the truck. Boulders, chunks of concrete, similar heavy, bulky one-piece objects that won't go in a straight bucket are quickly and easily handled with the big-capacity clam-action 4-in-1!

Clam-action 4-In-1 "takes over" where straight buckets falter!

"Carry-type scraper" action gives inch-close grading accuracy, lets the earth "boil" into the bucket for convenient loading and fast disposal. You can't compare erratic old-style straight-bucket loader performance to depth-controlled work like this! And you can also use 4-in-1 "carry-type scraper" action to strip and spread materials with inch-close accuracy!

See how versatile 4-in-1 clamshell action takes over on job after job where single-action, old-style straight bucket or limited duty rigs can't possibly compete! Try the 4-in-1 as excavator-loader and as earth-rolling bulldozer. Prove to yourself that only a clam-action 4-in-1 gives you job opportunities, unlimited. See your International Drott Distributor for a demonstration

Use easily controlled clam action to fill the 4-in-1 with elusive loose materials (like this crushed stone) —in one fast gulp! Many owners use this speedy load-in-place clamshell action for close-quarters loading. Also, for positive clean-up on building projects, to practically eliminate need for hand-shovel labor!

International Harvester Company, Chicago 1, Illinois
Drott Manufacturing Corp., Milwaukee 15, Wisconsin

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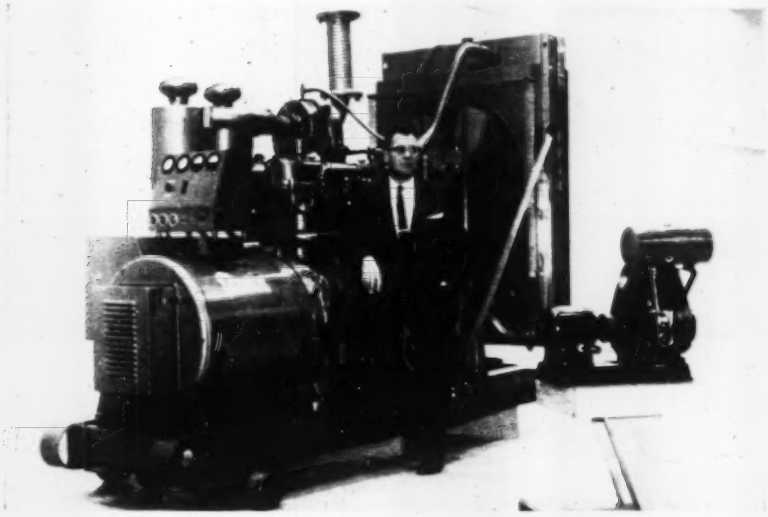

First and Latest Compared

Starting in 1926 with the 250-watt generator on the right, D. W. Onan & Sons, Inc., has built electric-generator sets for 39 years. It now presents the 200-kw diesel-generator on the left as the leader of its new expanded line for 1959.

C. W. Onan, president of the Minneapolis firm, stands beside the largest of eight new generating plants announced by the company. Ranging from 50 to 200-kw output, the units are specifically designed for either continuous or standby duty. Each unit is complete and self contained with engine, alternator, exciter and control panel in one compact unit.

Prime movers in the Onan plants, up to 150 kw, are Cummins diesels; Waukesha diesels power the 175 and 200 kw units. D. W. Onan & Sons, Inc., Minneapolis 14, Minn.

It's Light on Its Wheels

Galion's 4 to 6-ton retractable-wheel, tandem roller is equipped with "Roll-O-Matic" drive. The drive is a combination of torque converter, automatic fluid transmission and tail-shaft governor. It automatically increases or decreases rolling power as needed, the manufacturer states.

The hydraulically retractable wheels, which can be controlled from the operator's seat, make for fast tows from job to job.

The wheels and their stub axles are easily removed for close working. Galion Iron Works & Mfg. Co., Galion, Ohio.

4-D

WROUGHT IRON IN BUILDING PIPING provides lowest cost per year of service

WHERE TO USE IT:

- soil lines
- waste lines
- vent piping
- downspouts
- steam supply lines
- steam condensate returns
- electrical conduit
- hot and cold water lines
- underground lines
- cooling tower piping
- radiant heating systems
- snow melting systems
- sprinkler systems
- air conditioning systems
- refrigeration

Write for technical data on specific applications

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Tubular and Flat Rolled Products

A. M. Byers Co., Pittsburgh 22, Pa.

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How to select, specify and install waterstop. Also contains complete data on splicing, special types, etc.

2 Vertiseal Joint Sealing Compound

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Publications

Hydrographic data—A sixth edition handbook of technical data on float-operated water-level recorders and hydraulic tables entitled Hydrographic Data Book is available. It is designed as a reference file for hydrologists, oceanographers, meteorologists and engineers who work with projects that involve measurements of flowing liquids or fluctuating liquid levels.

Part I is about float wells and instrument shelters. Part II discusses error in float-operated devices. Part III is a compilation of tables and conversion charts. 124 pages, Leupold & Stevens Instruments, Inc., 4445 NE Glisan St., Portland 13, Ore. $1.00 ea.

Mobile testing laboratories—Mobile laboratory for on-site testing of soil, concrete and asphalt. 16-page brochure ML-100. Soiltest, Inc., 4711 W. North Ave., Chicago 39, Ill.

Tandem roller—complete specification for Model KT-7A, a 3-5 ton tandem roller. Also illustrates the one man attachment of towing wheels for transport. Bulletin D75-858. Buffalo-Springfield Roller Co. 1210 Kenton St. Springfield, Ohio.

Wheels and rims—A 94 page catalog contains pictures, general information, and engineering data on Goodyear wheel rims, wheels, tools and accessories. Includes highway, motor grader, industrial construction, earthmover items. One section of this tabbed catalog explains maintenance and operation and includes pictures and text on mounting and dismounting a variety of tires. Metal Products Division, Goodyear Tire and Rubber Co., Akron 16, Ohio.

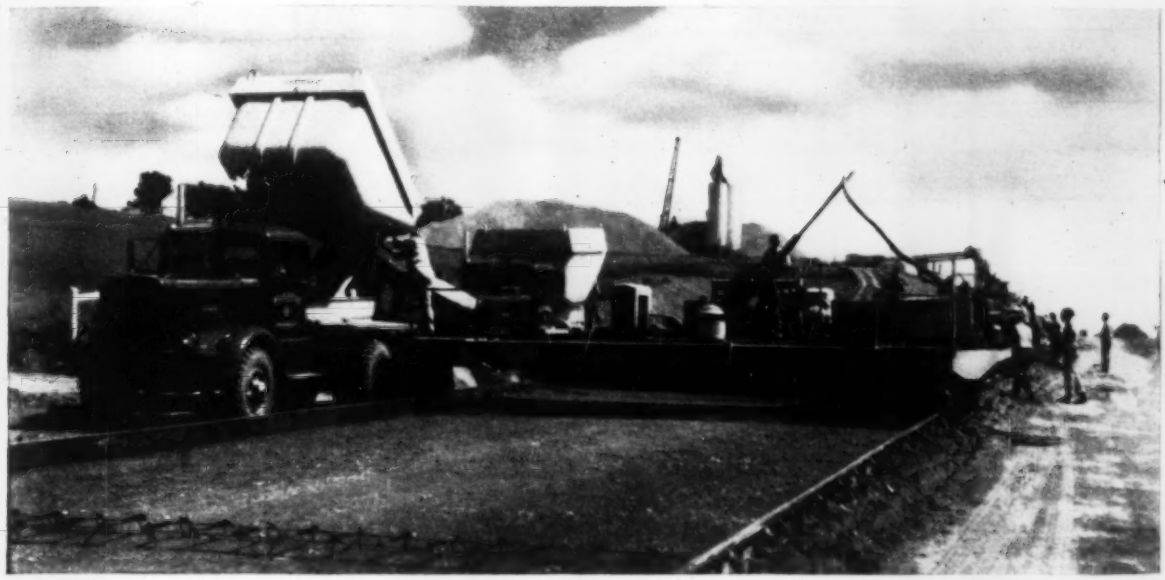
Conductor slide rule—A logarithmic conductor slide rule helps to select aluminum foil or sheet dimensions for strip-wound electrical coils. Available on request from Alcoa sales offices.

Laminated materials—Properties of Plymetl, a laminated structural material. 4 pages. Haskelite Manufacturing Corp., 701 Ann St., N.W., Grand Rapids, Mich.

Steel sheets—A buyer's guide to steel sheet and strip. 8-page bulletin No. 20-1. Joseph T. Ryerson & Son, Inc., Box 8000-A, Chicago 80, Ill.

Skylights—Annual catalog of Marcolite aluminum and fiberglass skylight products. 12 pages. The Marco Co., 45 Greenwood Ave., East Orange, N. J.

Now...Maxon Equipment gives you all the benefits of "central mixing—non-agitated hauling"!



DUMPCRETE TRUCK BODY

1. *Only body designed for non-agitated hauling of concrete from a centrally located plant to site.*
2. *Flexible delivery! Places concrete at one or more sites at the same time!*
3. *Faster charging. Loads the spreader bucket from either side.*

DUMPCRETE CONCRETE SPREADER

1. *Fast! Bucket takes full load in 60 seconds from the Dumpcrete Body.*
2. *Spreads the load in 15 seconds — works right over mesh and joint reinforcing.*
3. *Move-screeds in 15 seconds. No re-working! Entire cycle takes only 90 seconds.*

Here's higher production from a paving team that's been job-proved by top contractors on highways, runways and city streets. You're already familiar with the performance of Dumpcrete trucks on paving and mass concrete jobs. Now you'll want the fact-filled catalog that points out the many features of the Dumpcrete Spreader. See how it places one slab after another in 90 second cycles . . . how it handles up to 260 cu. yds. of concrete per hour . . . how hydraulic controls and simple design mean easier operation and trouble-free service. Send the coupon right now.

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MAXON CONSTRUCTION COMPANY, Inc.
Manufacturing Division =51 • 2600 Far Hills, Dayton 19, Ohio

Please send me the new Dumpcrete Spreader catalog with specifications

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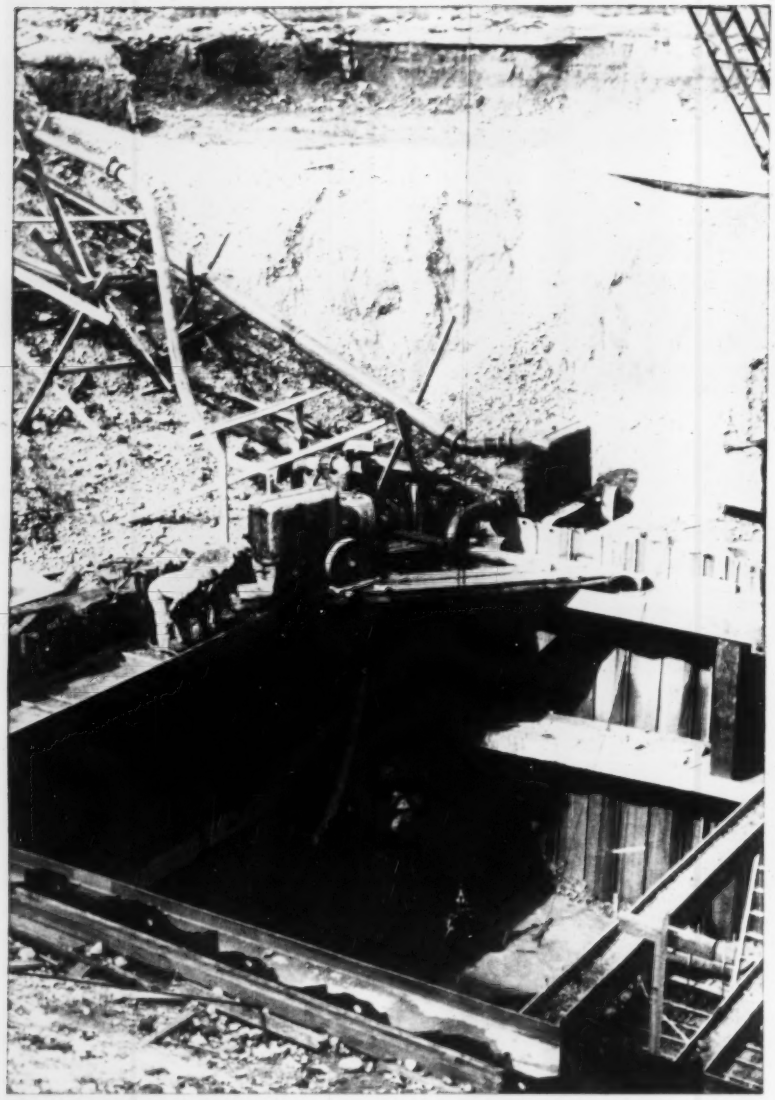

SUMP SOLVES PROBLEM OF HEAVY INFLOW IN COFFERDAM 22' BELOW RIVER: This 54' x 41' riverside excavation is 22' below water level in granular soil. Every morning, a Jaeger 10" pump dewatered the cofferdam in about 1½ hours (a 350,000 gallon job), and then pumped out the continuing heavy inflow gathered by a peripheral drainage ditch and sump so that a reinforced concrete foundation could be poured "in the dry."

ABOVE: Discharge from the 10" pump.

LEFT: 10" pump drains sump; 6" pump is standby. Clamshell removes washed-in solids.

BIG CAPACITY IN 110 LB. PUMP: On this job of dewatering small bridge footers, 2" aluminum model pumps 9300 gph at 10' suction lift. Hardened replaceable liner plate, and stainless steel insert at point of greatest wear, insure long life.

3000 GPM AT 320' HEAD: Two Jaeger 6CPH pumps with Chrysler industrial engines supply gravel washing plant with 3000 gpm at terminal pressure of 115 psi. Reservoir is 40' below plant and 120' away. Discharge pressure at pumps is 140 psi; total head 320'. Smaller Jaeger 5CPH, delivering 750 gpm @ 115 psi, supplies the reservoir from a river located 115' lower and 4000' away.

WHY JAEGER PUMPS GIVE YOU THIS OVERSIZE PERFORMANCE

All contractors pumps are not "created equal." In a Jaeger pump, the shell and impeller are built oversize, the engine is of the largest horsepower applicable, the seal is positively lubricated and priming is by two independent, simultaneous actions.

That's why you get (1) Doubly-sure fast priming, (2) High capacity at much slower operating speeds, (3) Sustained efficiency and longest life from both the pump and engine.

Buy your pumps on today's facts: Ask your Jaeger distributor or write us for latest information and performance data on Jaeger Sure Prime pumps — 1½" to 10" self-priming centrifugals and 3"-4" diaphragm pumps for dewatering, 2" to 6" pressure pumps for jetting and other high head service.

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200 Dublin Avenue, Columbus 16, Ohio

ROTARY AIR COMPRESSORS • CONCRETE MIXERS • TRUCK MIXERS • PAVING SPREADERS, FINISHERS

Consulting Engineers Elect G. S. Richardson

George S. Richardson, a senior partner in Richardson, Gordon and Associates, consulting engineers of Pittsburgh, has been elected president of the American Institute of Consulting Engineers. He succeeds Hershel H. Allen.

Emil H. Praeger, of Praeger-Kavanagh, New York City, and Dean G. Edwards, of Edwards & Kelcey, Newark, N. J., have been elected vice presidents.

A graduate of the University of Colorado in 1920, Mr. Richardson began his civil engineering career as a chief of party and inspector for the Wyoming Department of Highways. He taught at the Towne Scientific School of the University of Pennsylvania and worked for 13 years for the Department of Public Works of Allegheny County, Pa.

He established his own consulting practice in 1930.

Mr. Richardson is a vice president of the engineering division of the American Road Builders Association and a former director of the American Society of Civil Engineers.

Engineering Student Made Public Service Director

A 34-year-old engineering student has been made the $12,500-a-year public service director for Toledo, Ohio.

He is Leonard E. Leis. Although he obtained a state license in 1955, Mr. Leis is still attending night school at the University of Toledo, working toward a degree in civil engineering.

The new director joined Toledo's municipal service 12 years ago as a rodman on a survey crew and rose to head of the service department. He succeeds William J. Gross, who resigned to become a division engineer with the Ohio Department of Highways.

Careers

Public Works

A. G. Gardner, former co-ordinating engineer for the Wyoming State Highway Department, has been named assistant highway engineer. He will have general supervision over construction, maintenance and plans and programming of the department.

Walter J. Manning has been named director of marine services for the Department of Transport of the federal government of Canada. He succeeds **Norman Wilson,** who has retired.

Barnard T. Van Wormer, former city manager and engineer at Empire, Ore., has been appointed assistant city engineer at Salem, Ore.

John M. Dempsey, of Jackson, Miss., has been appointed airport engineer by the Mississippi Aeronautics Commission.

Edwin J. Denman, former assistant engineer at Anderson, Ind., has been named city engineer at Auburn, Ind. His position, a new post for the city, will include the duties of **Ted Winebrenner, Sr.,** who resigned as city street commissioner.

Business

Nash L. Kelly, former sales engineer for Parks Iron Works, Inc., Dallas, has been named vice president and general manager of the company.

John E. Davidson has been named assistant to C. Warren Black, president of Arundel Corp., Baltimore, Md. Mr. Davidson has been active in construction engineering since 1941 and more recently has been executive vice president of dredging divisions, Williams-McWilliams Industries.

Education

George Town has been appointed dean of the Division of Engineering of Iowa State College. He succeeds **J. F. Downie Smith,** who resigned last year to enter private industry.

D. Allen Firmage has returned to his post as associate professor in the Department of Civil Engineering at Brigham Young University, Provo, Utah, after a leave of 18 months. While on leave he served as chief bridge design engineer for Capitol Engineers in Saigon, Vietnam.

Edward W. Comings, head of the School of Chemical and Metllurgical Engineering at Purdue University, has been appointed dean of the School of Engineering at the University of Delaware. He will succeed **William A. Hagerty,** who went to the University of Texas as dean of engineering.

4-D

WROUGHT IRON SNOW MELTING SYSTEMS assure permanent winter traffic safety

WHERE TO USE IT:

- hazardous highway areas
- highway approaches
- toll booth areas
- airport runways
- hangar door aprons
- airport taxi strips
- passenger loading areas
- ramps
- "drive-in" banks
- driveways
- marquees, balconies
- loading docks
- sidewalks

WHY 4-D WROUGHT IRON?

- built-in corrosion resistance
- good heat transfer properties
- rugged strength
- crushproof
- no thermal stresses with concrete
- good bending properties
- welds soundly, easily
- leakproof
- lowest cost per year of service

Write for technical data on specific applications

BYERS 4-D WROUGHT IRON

Tubular and Flat Rolled Products

A. M. Byers Co., Pittsburgh 22, Pa.

These Job "Supers" and Operators with comparison proof can tell you:

Planet-steered "24's" lick conditions too tough for clutch-steered crawlers

Ethan Smith, Superintendent for W. S. Fowler Construction Co., Oneonta, Alabama, reporting:

"My 20 years as operator, dirt foreman, and superintendent tell me International TD-24 dozers are really something for pioneering—especially in sidehill cuts through shot rock. Planet Power steering keeps the loaded blade in the sidehill without rear end slippage. And when we use the Torque-Converter TD-24 for pushing, it heaps the bowl full fast by crowding the push block, even through shot rock." The job: Working on a 3-mile section of new U. S. Interstate 31, in Blount County, Alabama—with 1,100,000 cu. yd. to move, including 350,000 of rock!

Don Doyle, TD-24 operator for Funderburk, Anderson & Stone, Sutherlin, Oregon, speaking:

"We are completing a tough rock road here where another machine (20-ton track-type machine of different make) tried and failed. The Torque-Converter and especially the TD-24 (planetary) steering system made this possible. We can side-cast and move out rocks other equipment can't possibly move." Contractor is building 17 miles of Forest Service access road into primitive mountain country—using two International TD-24 Torque-Converter crawlers for the pioneering and other dozer work.

States Edward A. Schultz, operator for John Schultz Contracting Co.,

Westbury, Long Island, New York: "The TD-24 Torque-Converter is easy to operate and also easy on equipment being push-loaded. It outworks any equal-sized tractor I have ever operated." Picture shows the Schultz TD-24 bulldozing large boulders from acreage being developed for a subdivision.

Superintendent Roy Allen, for George Grimmert, El Paso, Texas, says: "Our International equipment forms the backbone of our construction machinery fleet. The TD-24 Torque-Converter pusher is excellent, heaping on loads in 30 to 45 seconds whether the push is straight or curving. The 'live' track, power steering puts TD-24 performance in a class of its own." The contractor is providing 100,000 cu. yd. of fill dirt for a 490-home project in Fort Bliss, Texas.

See how your operators can give you new tough-job efficiency—can hand you paydirt dozing dividends of up to 50%—on Planet Power-steered International TD-24 crawlers. Prove what it means on benching, bank-cutting, or side-casting to command full-time "live" power on both tracks. Measure the advantages of Planet Power steering when dozing, pushing and pulling—eliminate "dead-track drag" on the turns—have instant, on-the-go Hi-Lo power-shifting! Call your International Construction Equipment Distributor for a demonstration!

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Construction Equipment

A COMPLETE POWER PACKAGE: Crawler and Wheel Tractors . . . Self-Propelled Scrapers and Bottom-Dump Wagons . . . Crawler and Rubber-Tired Loaders . . . Off-Highway Haulers . . . Diesel and Carbureted Engines . . . Motor Trucks . . . Farm Tractors and Equipment.

BUYING A NEW SHOVEL OR DRAGLINE?

National Torque Converters are available as original equipment on many leading makes

REPOWERING YOUR PRESENT SHOVELS?

National Torque Converters are available "packaged" or matched with virtually all leading excavator engines

When you have to figure close on a contract job . . . a little extra efficiency in the equipment can make the difference between a loss and a profit.

The National Torque Converter gives this all-important extra. It *takes in* power with the engine working at its most efficient speed and output range. It *delivers* the power at speeds and torques best suited to each operation. It multiplies the torque and so boosts line pull or bucket push, up to three times that available from the unaided engine. It's like having an extra engine when you need it.

You can get these advantages on new equipment . . . for the converters can be specified for original installation on most leading makes. You can get them in repowering old equipment . . . for National Torque Converters are available packaged with many leading makes of diesels . . . and perfectly matched to the rest.

For information . . . just write:

THE NATIONAL SUPPLY COMPANY

Subsidiary of Armco Steel Corporation

TWO GATEWAY CENTER, PITTSBURGH, PA.

Obituaries

F. B. Spencer Dies; Noted Foundation Engineer

Frederick B. Spencer, retired vice president of Spencer, White & Prentis, Inc., contractors and engineers of New York, and past president of Spencer & Ross, Inc., Detroit foundation builders, died at the age of 68.

Mr. Spencer had a distinguished career in the foundation construction field. He received an AB degree in 1911 and a civil engineering degree in 1913, both at Columbia University. He spent the next ten years working on various subway, pier and foundation projects in the east before going to Ford, Bacon & Davis as principal design engineer for the New Orleans Army Base.

As president of Spencer & Ross, Inc., from 1923 to 1933, he was involved with the Cleveland Union Terminal project. The substructure for this job, 270 ft deep, was one of the deepest open foundations in the world.

From 1933 on, he was an officer of Spencer, White & Prentis, Inc. Among the many types of projects he directed were dam and lock construction in the Mississippi Valley and drydock construction on the east coast for the U. S. Navy. During the war, he was in charge of ship building for the Alabama Drydock & Shipbuilding Co., of Mobile. He retired from Spencer, White & Prentis, Inc., last fall.

Frank G. Breslin, 90, founder of the Breslin Construction Co., Louisville, Ky. His company, which specialized in road and street construction, was formed in 1905. He retired from management of the firm in 1939.

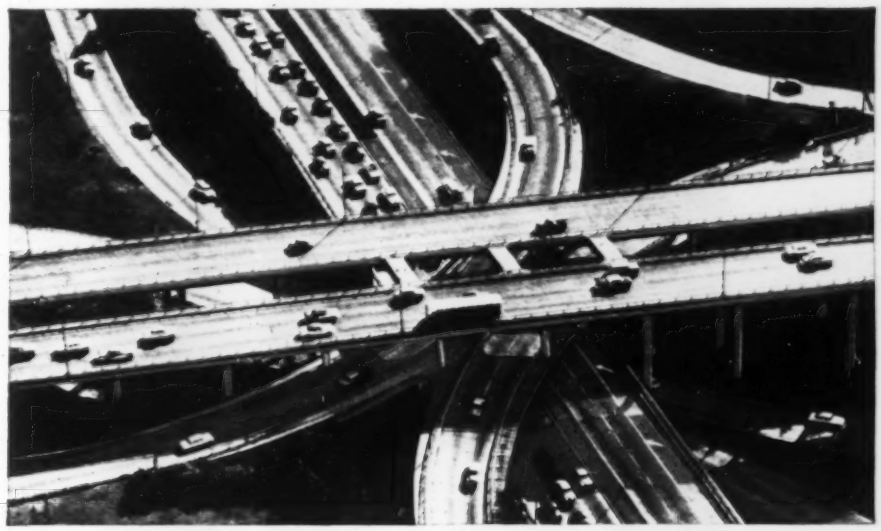
A. B. Long, Sr., 64, a builder of highways in Tennessee for 43 years. He operated the A. B. Long Construction Co., of Knoxville, with his sons.

Sam C. Lombardo, 58, partner in Lombardo Brothers Construction Co., Cleveland. His firm helped to build the Willow and Bratenahl Freeways, the West Shoreway and eight miles of the Ohio Turnpike.

Paul E. Pletcher, 52, a former engineer with the Ohio Department of Highways. He was a former co-owner and operator of Phillips and Pletcher Construction Co., Grover Hill, Ohio.

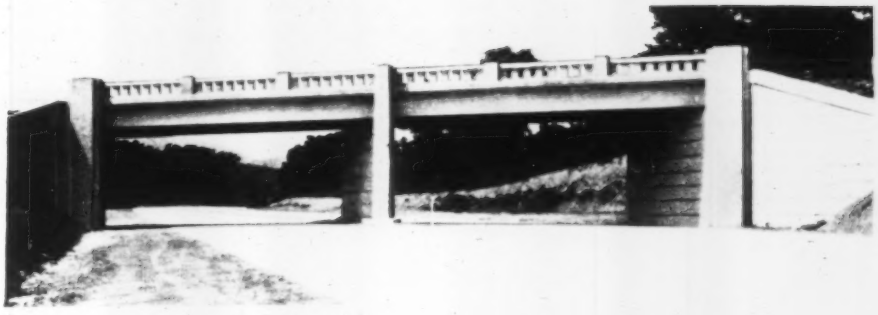
F. Carlisle Coates, 61, construction engineer with the Vermont Department of Highways. A graduate of Middlebury College in 1923, he joined the department in 1926 as a surveyor.

Complex Interchange...



Four-level reinforced concrete Los Angeles Freeway separation structure

Or a Simple Bridge...



Simple girder reinforced concrete bridge in Bedford County, Pennsylvania

You can stay on schedule when you design in

Reinforced CONCRETE

For every complex multiple overpass in use today, there are a thousand or more simple bridge structures. Whether the bridge design problem be complicated or simple, highway engineers are finding reinforced concrete the logical, economical solution.

Reinforced concrete provides a construction material of unusual flexibility and durability. On your next bridge or multiple overpass, design for beauty plus economy . . . and stay on schedule with REINFORCED CONCRETE.

CONCRETE REINFORCING STEEL INSTITUTE
C.R.S.I.
FOUNDED 1924

Concrete Reinforcing Steel Institute
38 South Dearborn Street, Chicago 3, Illinois

FASTER SET... ACCELERATED EARLY STRENGTH
when you add
COLUMBIA CALCIUM CHLORIDE to your concrete

You're right on schedule. The bucket drops the last pour . . . then an unexpected spring chill moves in. What happens to your pour? That schedule? Your profits? With Columbia Calcium Chloride added to the pour, both your schedule and profits are protected. And that's why more contractors every spring add Columbia Calcium Chloride to their concrete. Here's what Columbia Calcium Chloride does:

1. **Faster initial set.** Time is cut from 3 hours to 1 hour under normal conditions.
2. **Faster final set.** The same ratio holds true; you get final set in 2 hours rather than the usual 6.
3. **Accelerated early strength.** Columbia Calcium Chloride treatment produces 2-day strength in just 24 hours, 7-day strength in 3½ days.

These specific advantages all add up to money saved on earlier form removal and less night finishing, in spite of cold nights. Protective measures at freezing temperatures should always be followed. But the protection time will be reduced greatly—often from 7 days to 3—when you use Columbia Calcium Chloride.

For more information on schedule-saving, profit-making Columbia Calcium Chloride, just contact your nearest Columbia-Southern District Sales Office or write directly to our Pittsburgh address.

COLUMBIA-SOUTHERN CHEMICAL CORPORATION

A Subsidiary of Pittsburgh Plate Glass Company • One Gateway Center • Pittsburgh 22, Pennsylvania

DISTRICT OFFICES: Cincinnati • Charlotte • Chicago • Cleveland • Boston • New York • St. Louis • Minneapolis • New Orleans • Dallas • Houston Pittsburgh • Philadelphia • San Francisco IN CANADA: Standard Chemical Limited

Earthfill Dam in California

Compacted embankment accounts for 22% of $3.2-million contract for domestic water supply project

The Whale Rock Dam in San Luis Obispo County near Cayucos, Calif., will require 1,769,400 cu yd of compacted embankment at 30¢ a yd, and an additional 480,000 cu yd at 33¢.

This accounts for almost 22% of this $3,194,024 contract to Morrison-Knudsen Co., Inc. and Darkenwald Construction Co., Inc., Sacramento, Cal.

This earthfill dam, a domestic water supply project, is for the State of California Department of Water Resources, Sacramento. Dam will be approximately 800 ft long and 183 ft high. Work includes concrete outlet pipe and controls, concrete spillway, road relocations, miscellaneous appurtenances and related work.

Prevailing wages include: carpenters, $3.65; tractor operators, $4.01; crane and shovel operators, $4.12; concrete workers, $3.12; common laborers, $2.89.

The bidding included:

1C Morrison-Knudsen Co., Inc., & Darkenwald Constr. Co., Sacramento, Cal.	$3,194,024
2 Piombo Constr. Co. & M\&K Corp., San Carlos, Cal.	3,202,562
10 Cox Bros. Constr. Co. & W. E. Kier Constr. Co., Stanton, Cal.	5,409,320

Bids: 12-17-58 Items	Unit	Quantity	Unit Prices 1C	2
Clear & grub	ls	job	$155,000	$120,000
Divers. & care stream dur const & dewatering fndn	ls	job	40,000	30,000
Infiltera basin embankment	cy	1,000	0.20	1.50
Injection well	lf	100	25.00	15.00
Borrow exc, areas A&B	cy	1,203,000	0.30	0.19
C,D,E,F	cy	506,000	0.45	0.52
Overburden exc, areas Q&W	cy	50,000	0.75	0.65
Excavation, area X	cy	350,000	0.35	0.41
Processed filter material	cy	40,000	0.70	1.10
Unprocessed matl, areas K, L&M	cy	46,000	0.50	0.50
Drain matl from Area Q	cy	40,000	3.00	2.10
Bedding matl for riprap from area Q	cy	16,300	3.00	2.20
Riprap from area Q	cy	50,000	2.30	2.20
Excavation, foundation	cy	442,600	0.60	0.35
grout cap	cy	400	12.00	15.00
outlet conduit	cy	40,000	0.80	2.00
intake tower	cy	400	10.00	15.00
spillway	cy	142,800	0.75	0.75
access roadway	cy	15,800	0.70	0.60
Compacted embankment material, Zone 1	cy	1,769,400	0.30	0.18
Zone 2	cy	480,000	0.33	0.18
filter & drain matl	cy	80,000	0.33	0.08
Consolidated backfill	cy	600	3.00	1.65
Add rolling for compactn	hr	500	15.00	13.00
Drill grout holes, cl 1	lf	3,180	2.00	3.00
cl 2	lf	1,590	2.10	3.00
Pipe & ftgs for grtg oper	lb	2,400	0.50	0.70
Connections to grt holes	ea	160	10.00	5.00
Pressure grouting	cy	5,000	1.35	1.10
Drill anchor bar holes	lf	4,580	1.50	2.50
Concrete in spillway approach walls	cy	300	27.00	45.00
weir	cy	300	27.00	34.00
chute floor	cy	1,040	35.00	30.00
chute walls & surface drainage structure	cy	680	60.00	76.00
Conc in stilling basin floor & floor block	cy	1,320	21.00	30.00
walls	cy	715	27.00	73.00
Concrete in intake tower footing	cy	55	38.00	35.00
below elevation 232.5'	cy	530	71.00	56.00
operating house	cy	10	165.00	150.00
Conc, valve & blowoff energy dissipator vault	cy	85	65.00	70.00
encasement of outlet conduit	cy	2,250	22.00	18.00
grout cap	cy	400	27.00	35.00
gutter adj to spillway	cy	125	90.00	70.00
backfill	cy	700	22.00	50.00
Portland cement	bbl	10,000	4.50	5.00
Pozzalan	bbl	1,800	4.40	8.00
Reinforcement	lb	1,020,000	0.13	0.13
Rubber water stop	lf	1,340	2.00	2.00
Welded steel pipe, 48"	lf	1,395	35.00	50.00
Cmt mortar lining in 48" welded steel pipe	sf	21,930	0.70	0.70
Welded steel pipe, 30"	lf	135	15.00	35.00
8-5/8"	lf	48	5.00	12.00
Pipe line, 2½"	lf	920	2.50	2.00
1¼"	lf	1,530	1.30	1.70
Cast iron pipe, 4"	lf	120	6.50	6.56
Spun RCP, 30" inside ⌀	lf	1,065	36.00	42.00
Cor metal pipe, 18"	lf	90	10.00	9.00
Tile drains	lf	3,000	2.00	2.70
Metalwork, intake tower	lb	16,120	0.75	0.60
valve vault	lb	9,300	1.00	1.20
Rub seat butterfly valve at intake tower, 24", 25 psi	ea	1	2,460	1,800
50 psi	ea	2	2,460	2,400
125 psi	ea	2	2,733	2,700
in blowoff line, 30", 125 psi	ea	1	3,838	4,200
in Venturi meter sect, 14", 125 psi	ea	1	1,351	1,400
Venturi & recording meter	ls	job	1,100	5,000
Propeller type meter, 6"	ea	1	560.00	450.00
Turbine pump unit, 3 hp	ls	job	1,500	500.00
Electrical installation	ls	job	10,000	5,000
Access road bri & abuts	ls	job	14,000	13,000
Surfacing, plant mix	sy	6,100	2.00	1.20
Fence, 4-str barbed wire	lf	5,800	1.06	0.90
6' chain link	lf	910	3.40	3.60
Steel guard posts, 4"	lf	16	20.00	14.00
Redwood water tank	ls	job	1,000	1,200
Timber bulkhead	ls	job	250.00	350.00
Slush grouting	cf	1,000	2.00	3.00
Strip exc, borrow areas	cy	150,000	0.25	0.25
Welded steel pipe, cement mortar coated, 48"	lf	345	40.00	45.00
RCCP, cl 4, 30" inside ⌀	lf	310	15.00	18.00
Abutment drain manholes	ea	2	1,700	1,200

Completion schedule: 720 cal days.
Liquidated damages: $300 day.

Wet Rock Excavation for Rockland Harbor, Maine

Ledge rock totalling 3,250 cu yd and overlying material totalling 4,750 cu yd, removed to a depth of 15 ft below mean low water from the Rockland Harbor, Me. will cost $34 and $10 per cu ft.

The $158,000 award to Alton Prock & Sons, Waldoboro, Me., by the Corps of Engineers, Waltham, Mass., was 34% below the engineer's estimate. John Wm. Leslie, Waltham, Mass., is the engineer.

Minimum wages range from a high of $2.90 for skilled to $1.97 for common laborers.

1C Alton Prock & Sons, Waldoboro, Me	$158,000
2 Seaboard Engr. Co., Portland, Me	219,500
5 Perini Corp., East Boston, Mass	344,000
EE Corps of Engineers, Waltham, Mass	239,390

Bids: 1-15-59 Items	Unit	Quantity	Unit Prices 1C	2
Remove and dispose of all matl underlying rock, other than ledge rock, to grade 14' below mean low water	*cy	4,750	$10.00	$12.00
ledge rock to grade 15' below mean low water	*cy	3,250	34.00	50.00

Commence: Feb. 1959 Complete: 6-15-59.
Liquidated damages: $150 cal day. * Place measure.

4-D

WROUGHT IRON IN WATER AND SEWAGE PLANTS stymies corrosion

WHERE TO USE IT:

- gas lines
- heat exchanger tubes
- digestor heating coils
- raw sewage lines
- sludge lines
- compressed air lines
- guard railings
- electrical conduit
- chlorine lines
- ammonia lines
- outfall lines
- boiler piping
- weir plates and baffle plates
- smokestacks
- sludge tanks
- manhole ladder steps
- storm sewer buckets
- soil, waste, vent and downspout lines
- hot and cold water piping

Write for technical data on specific applications

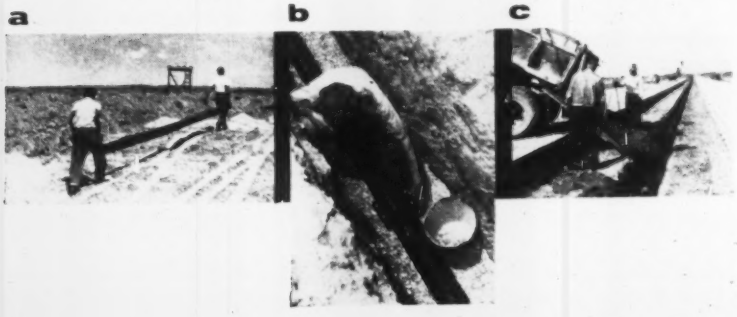
BYERS 4-D WROUGHT IRON

Tubular and Flat Rolled Products

A. M. Byers Co., Pittsburgh 22, Pa.

For The Permanent Solution To

...USE THE HANDY



a 20-foot sections of Armco Perforated Pipe are handled by two men.

b Strong, tight joints are quickly made with coupling bands and bolts.

c Well-graded sand is recommended backfill for most subdrainage systems.

This Headache

COUPON

Send my copy of 24-page manual on Ground Water Control

Name_____ Title_____

Organization_____

Address_____

City_____ Zone____ State_____

Unwanted ground water in the subgrade reduces the load-carrying capacity of the soil. Result: pavements can't carry the load. They fail. Maintenance costs go up and up.

But there *is* a lasting, sure answer to the problem. Subdrainage systems of Armco Perforated Pipe will remove the unwanted water and *keep it out.*

Here's why Armco Perforated Pipe is a better way to build those subdrains: Infiltration area is controlled. Water is admitted through rows of strategically placed holes in the lower third of the pipe. These holes are large enough to collect water, small enough to exclude solids. Tight joints of Armco Pipe are important, too. Solids can't enter at the joints.

Installation, too, is simplified with Armco Pipe. Long, 20-foot lengths reduce the number of sections to be hauled, handled and installed. For the complete story on ground water control, use the coupon. Or write us, outlining your subdrainage problem. Armco Drainage & Metal Products, Inc., 4719 Curtis Street, Middletown, Ohio.

ARMCO DRAINAGE & METAL PRODUCTS

Subsidiary of ARMCO STEEL CORPORATION

OTHER SUBSIDIARIES AND DIVISIONS: Armco Division • Sheffield Division • The National Supply Company
The Armco International Corporation • Union Wire Rope Corporation • Southwest Steel Products

29,000 lbs. - and all muscle!

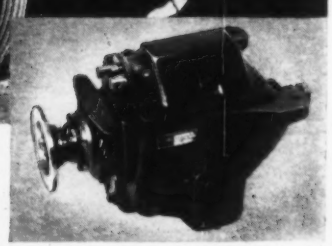
Bring on those gruelling, earth-moving, profit-making jobs and just watch this mighty Dodge D800 dump truck clean them up.

It weighs in at 29,000 lbs. maximum G.V.W. It's big and tough. It's packed with power and the right equipment to get the job done in short order. Special transmission, if you need it—special axle, springs, brakes—whatever your kind of trucking requires.

Big-load hauling was never easier . . . never more profitable . . . than in new, improved '59 Dodge "Job-Rated" heavy-duty trucks with G.V.W.'s to 49,000 lbs., G.C.W.'s to 65,000 lbs.

Your Dodge dealer has full information. He'd like nothing better than to talk to you, and tell you why . . .

today,
it's real smart
to choose **Dodge Trucks**



To provide maximum flexibility in loaded, off-road service and at unloaded highway speeds, a 4-speed auxiliary transmission is now offered for all conventional and tandem models in the Dodge 800 and 900 series. Another benefit for more truck buyers!

Materials and Labor Prices

Monthly Market Quotations by ENR Field Reporters

See following ENR issues for OTHER PRICES:

- Iron and Steel Products: Last, Feb. 12; Next, Mar. 12
- Wood Products, Glass, Explosives, Chemicals: Last, Feb. 19; Next, Mar. 19
- Clay Products, Lime, Plaster, Paint, Roofing: Last, Feb. 26; Next, Mar. 26
- Wages Rates, Building Board, Lath, Insulation: Last, Feb. 26; Next, Mar. 26

CEMENT, AGGREGATE, READY-MIXED CONCRETE—F. O. B. CITY

	PORTLAND CEMENT* Per bbl. C. L. lots cash, dis. not deducted			SAND AND GRAVEL Per ton, carload lots			CRUSHED STONE Per ton, carload lots		CRUSHED SLAG lots, f.o.b. plant		CONCRETE BLOCK 8x8x16-in.† truckload del.,* per block		CONCRETE Ready Mixed 1:2:4 del.
	Paper	Bulk	Mortar	Gravel, 1½ In.	Gravel, ¾ In.	Sand	1½ In.	¾ In.	1½ In.	¾ In.	Sand grav.	Lt. wgt. agg.	50 cy & over
Atlanta	$4.35a	$3.95a	$3.60a	$3.10e	$3.10e	$1.85fa	$2.18s	$2.33s	$1.65r	$1.75r	$0.175o	$0.21o	$15.75g
Baltimore	4.43a	4.03a	3.54a	2.80fg	2.80fa	2.25fa	2.85fa	2.90fa	2.05fa	2.00fa	18a	18a	13.50mz
Birmingham	4.23c	3.80cf		2.53ce	2.53ce	2.13ce	2.75ce	2.75e	1.55df	1.65df	18	18	13.55g
Boston	5.80ap	4.52ap	4.80amp	3.00qce	3.00qce	3.00qce	1.75qce	1.85qce			23o	27.5ao	15.00g
Chicago	4.13aq	3.87aq	3.90/3.95p	3.78fe	3.78fbe	4.13fbe	3.95fbe	3.95fbe	2.25fe	2.25fe	25fe	25fbe	14.00ef
Cincinnati	4.68c	4.16c	4.18c	2.29fcu	2.34fcu	2.34fcu	2.64fcu	2.64fcu	1.89u	1.89u	19o	24ao	13.75prf
Cleveland	1.25		3.89fae	2.25ae	2.10ae	1.75ae	2.80fg	2.80fg	3.45ef	3.45ef		22f	15.50u
Dallas	3.75a	3.25a	3.63a	2.65fa	2.75fa	1.90fa	2.43	2.63				27	12.50z
Denver	4.79a	4.29a	4.79	1.90fa	2.10fa	1.37fb		3.35fz			22	27ao	11.90
Detroit	4.25a	3.74aqq	3.72a	4.50fabm	4.50fabm	4.25fabm	3.75fabm	3.75fabm	2.47aqaa	2.47aqaa	22p	25fap	14.40p
Kansas City	4.23a	3.83a	4.10a			1.70fa	2.00fa	2.00fa			22a	26c	13.50
Los Angeles‡	5.12rh	4.68rh	5.60c	2.56fat	2.76fat	2.41fat	2.41fat	2.46fat			17fm	28.5m	12.96hf
Minneapolis	4.52a	4.11a	4.08a	2.70fae	2.70fae	1.60fae	3.95fae	3.95fae			19q		14.30f
Montreal	3.36fde	3.11fde	3.72fde	1.90fa	2.15fa	2.40fa	1.90fa	2.15fa	2.00s	2.00s	20	28f	10.80erk
New Orleans	4.06b	3.65b	3.85b	2.45b	2.45b	2.00bf			1.65df	1.75df	27.5r		14.00o
New York	4.80a	4.29a	3.84		3.20bk	2.30bk	3.10bl	3.10bl			26.5mw	32.5bc	18.10at
Philadelphia	4.57fae	4.16fae	3.61fe	2.85fa	2.85fa	2.35fa	2.70fa	2.80fa	2.20fa	2.20fa	25/32		14.15df
Pittsburgh	5.65bjk	4.62bj	5.00bjl	2.65fajp	2.65fajp	3.05fajp	2.00fajp	2.00fajp	2.20e	2.20e	26r	26r	15.80s
St. Louis‡‡	4.16/4.48a	3.76/4.08a	3.86/4.18a	3.25fae	3.10fae	2.40/3.10fae	1.65fe	1.75fe			24.5a	30.5co	12.65/13.15g
San Francisco	4.34c	3.79c	4.78c	2.02	2.02	2.12	2.17	2.17			24	28.5f	13.00cse
Seattle	4.22fa	3.60aq	4.40a	4.25fbm	4.25fbm	4.25fbm	4.50fbm	4.50fbm			26a	32ra	13.90f
Toronto	4.00n	3.84d	4.00n	2.40	2.40	2.05	2.40	2.40	2.20	2.20	26	27.5cu	15.25a

‡ Delivered. * Prices incl. dealers discount except as noted. † Add 4% sales tax. †† Add 2% intrastate sales tax. R Revised eff. 3 1 57.

CEMENT: *a Less 10¢ disc. 15 days. *b Less 2½% disc. 15 days. *c Less 10¢ disc. 10 days. *d 10¢ disc. 20 days. *e Truckload lots. *f Fob mill, add $14.58 to $21.31 per car switching charges. *g fob mill + freight. *h LCL. *i Less 2½% disc. 10 days. *j Truck lots fob yard. *k 100 bag lots. *l over 150 sacks. *m Sold in bags only. *n Less 5% disc. 30 days. *o Plus 50¢ for Sat. del. *p 5-8 ton truckload. *q F.o.b. mill.

SAND, GRAVEL, STONE & SLAG: *a Truck lots. *b Per cu. yd. *c 5 tons up. *d Less 5¢ disc. 15 days. *e Less 2% disc. 10th. *f Less 2% disc. 15th. *g Less 5% for cash. *h Less than 5 tons. *i Plus 8% mun. & prov. tax. *j F.o.b. quarry. *k Barge lots asd. *l F.o.b. scow Hudson river. *m Less 2½% for cash. *n F.o.b. cars. *q F.o.b. yard. *r Less 5% disc. 15th. *s Less 2½% disc. 10 days. *t Less 10¢ disc. 10 days. *u Less 5¢ disc. 10 days. *v Less 2% disc. 15 days. *w Less 10¢ disc. 15 days. *x Incl. 35¢ switch. charge. *y F.o.b. dock. *z 5-8 tons. *aa less 5% disc. 15 days.

CONCRETE BLOCK: *a Cinder. *b Waylite. *c Haydite. *d Celocrete. *e 5⅛ x 8 x 12 in. *f 8 x 4 x 16. *g F.o.b. truck at job. *i F.o.b. plant San Rafael. *m F.o.b. yard. *n 8 x 8 x 18. *o Less 2½% disc. 10 days. *p Less 2% disc. 10th. *q Less 5% disc. 10th. *r Less 2½% disc. 15 days. *s Less 2½% disc. cash. *t Siporex, 7 x 8 x 18. *u Less 5% disc. 10 days. *v Less 12½ disc. 15th. *w Eff. 1 1 57.

READY MIXED CONCRETE: *a 6 cu yd or over del. Mon. *b 25 cu yds or more. *c 10-100 cy. *d 1-3 mi. zone add 15¢ for ea. add'l 1-mi. zone. *e 2,000 lb comp. *f 2,500 lb comp., less 5% disc. 30 days. *g Less 25¢ disc. 15 days. *h Less 50¢ for cash. *i 5% off for cash. *j 2% off for cash. *k Federal tax included. Add 6% mun. & prov. tax. *l 1:2:3 base price. *m F.o.b. yard. *n Plus escalator clause. *o Less 2% disc. 15 days. *p Less 50¢ disc. 15 days. *q Less 2% disc. 10 days. Add 50¢ per zone. *r 2000 wgt. *s Less 5% disc. 10 days. *t Incl. 50¢ heating. *u Less 2% disc. 15th. *v Sat. del. +50¢. *w 10-100 cy.

CURRENT MAXIMUM PRICES AT CEMENT MILLS: Subject to 10¢ discount, 15 days. For paper bags add 40¢ per bbl., not refundable.

	Bulk		Bulk		Bulk		Bulk		Bulk
Richard City, Tenn	$3.45†	Buffington, Ind	$3.40†	Steelton, Minn	$3.45†	Muskegon, Mich	$3.45†	Toledo, O	$3.45†
Clinchfield, Ga	3.45†	Independence, Kan	3.25†	Leeds, Ala	3.30†	Saginaw, Mich	3.45†	Milwaukee, Wis	3.50†
Kingsport, Tenn	3.45†	Hannibal, Mo	3.35†	Duluth, Minn	3.45†	Wyandotte, Mich	3.45†	Green Bay, Wis	3.50†
West Des Moines, Iowa	3.50†	Northampton, Pa	3.50†	Hudson, N. Y.	3.50†	Buffalo, N. Y	3.55†	Ironton, O	3.45†
Nazareth, Pa	3.50†	Universal, Pa	3.60†	Alpena, Mich	3.35†	Oswego, N. Y	3.60†	Montreal City	2.56†
Bath, Pa	3.50†	Waco, Tex. (+ 10¢ tax)	3.35†	Detroit, Mich	3.45†	Cleveland, O	3.50†	W. Winfield, Pa	3.60†
Lesley, Pa	3.50†	Giant, S. C	3.45†	Howes Cave, N. Y	3.50†	Alson, N. Y.	3.50†	Security, Md	3.50†

† *Price to hold for first quarter of 1959.* ‡ *Price guaranteed through December 31, 1959.*

PAVING BRICK, BLOCK, ASPHALT, ROAD OILS—F. O. B. CITY

	PAVING BRICK AND BLOCK			PAVING ASPHALT Per ton, less than 80 penetration		ASPHALT BINDERS FLUXES Per gal., 80-300 penetration		CUTBACK ASPHALT MC per ton		ROAD OIL Per gal.	ASPHALT EMULSION RSI Per gal.	
	Granite Per M lots of 50,000 4x4x8 in.	Brick per M 3x4x8½ in. carload lots	Wood per sq. yd. 3½ in. 16-lb. treat	Tank car	Drums	Tank car	Drums	Tank car	Drums	Tank car	Tank car	Drums
Atlanta				$26.60PS	$45.00PS	$0.11PS	$0.235S	$0.12mS	$0.235mS	$0.12S	$0.11S	$0.235S
Baltimore	150.00			23.00t		.095t	0.185t	10mE	19mE	10t	105t	0.195t
Birmingham		66.00k		25.12	25.69O	1069	0.1093O	1162	11880	1006O	1069	0.1093Q
Boston				22.00qaS	46.00qaS	22.00aS	46.00aS	105mF	24mF	14aOR	150R	
Chicago	150.00‡a	90.00‡ab	3.95/4.00‡af	21.20b	31.20b	20.40fe	30.40fe	975bmH	1775bmH	086		
Cincinnati												
Cleveland		89.50‡dg	6.30g	26.00fA		26.00rsA		1165mAP			1265fAG	21AG
Dallas	s	40.80p	s	26.82	46.20	1138	1983	30.45	52.40	.1100	1138	1983
Denver		50.00										
Detroit		116.00		33.05		32.45s		13.50mI		1133		.28
Kansas City	s	s	s	18.00cl		18.00es		0825cmJ		079e	0.125c	
Los Angeles‡	s		s	21.50dmz		21.50dsz		23.00dK		22.00dqaa	23.90jqs	26.30jqs
Minneapolis			3.73A	26.00		26.00s		0.115m		0.105	1305	
Montreal	s	s	s	32.50n	59.80n	176n	226n	18.70muE	23.70muE	154n	242n	27nX
New Orleans				20.00s	o	20.00es		095mc	o	085eR	095eRL	1905eR
New York			3.70f	21.99m	43.94m	21.99st	43.94st	10.61uP	20.01uP		10.68u	20.11u
Philadelphia	175.185	110.120	4.05	18.21U		20.21U		0.085 10PU		0.085 10U		
Pittsburgh	60.00k	95.00n	6.35n	31.20ns		31.20ns		1403‡S		142S	1403s	
St. Louis‡‡				19.74r		1825f		089376eM	09185u	0.165f	1825‡OR	825QR
San Francisco		70.00		23.50g	42.00g	23.50gks	42.00gks	24.50gN	43.00gN	24.25gnW	24.50gnX	2063gX
Seattle				25.00z	40.00A	25.50rscc		26.50KE		24.25knY	23.50knX	45.10knX
Toronto		148.50	4.50f	41.30	60.83	0.2143	0.2505	9.22w	0.264w	0.204	0.216Z	271Z

‡ Delivered. + Add 4% sales tax. †† Add 2% intrastate sales tax. R Revised.

PAVING BRICK & BLOCK: *a Less 2½% disc. 10th. *b 3 x 3½ x 8. *c 2¼ x 8½ x 4. *d Truckload lots. *e Not used. *f 2" interior 6 lb. tr. *g Less $1 M disc. 15th. *h 2" tr. 8 lb. *i 3 x 3½ x 8½. *j 2½", 6 lb. tr. *k Used. *l Redshale. *m Pine oak $6.57. *n Truck del. *o Less $1 M disc. 15 days. *p Used: $40; new: $80.

ASPHALTS: *a F.o.b. refinery, Everett, Mass. *b F.o.b. refinery, Lockport, Ill. *c F.o.b. Sugar Creek, Mo. *d F.o.b. refinery, El Segundo. *e F.o.b. Baton Rouge. *f F.o.b. Hartford, Ill. *g F.o.b. refinery, Richmond, Calif. *h F.o.b. Martinez. *i F.o.b. refinery, Baltimore. *j F.o.b. refinery, Inglewood, Calif. *k 50 110 penetr. *l Less than 100 penetr. *m 40 300 penetr. *n F.o.b. refinery, Montreal. Fed. tax included; add 6% for mun. & prov. *o Drums not avail. Shipped in steel bbl. *p 80/70 penetr. *q RSI. *r In customer's drums. *s Shipped in drums, per drum. *t 150 300 penetr. *u Per 100 gal. *v Per ton. *w Per gal. *x Also tank trucks. *y F.o.b. Oakland. *z F.o.b. Edmonds. *A F.o.b. refinery, Cleveland. *B F.o.b. Destrehan, La. *E RC. *F Also RC. *G Also MS, SS. *H RC 0-5 incl. *I MC 4. *J MC, RC $6.095. *K MC 3, 4, & 5. *L MS. *M MC 1-5, RC 1-5, $0.0915. *N MC 3. *O Truckload. *P F.o.b. refinery, Atlanta. *Q F.o.b. Eldorado, Ark. *R Delivered within 50 mi. *S Less 2% disc. 10 days, net 30. *T Less 1% disc. 10 days. *U F.o.b. refinery. *V Less 2% disc. 15 days. *W SC 2. *X RS 1. *Y SC 1. *Z Incl. 10% Sales Tax. *aa SC 3, 4, & 5. *bb RS 2. *cc In used drums.

Construction Reports

Bids Asked—Low Bidders—Contracts Awarded—

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 36, N. Y., ELSIE EAVES, Manager
J. A. MAHONEY, M. WETZEL, M. E. SCIORRA, D. TARTAGLIA, MARIE MORAVSIK, ELAINE CHOMYAK, ELIZABETH WERRA, ELEANOR QUERET, Reports, J. H. WEBBER, E. R. HUBER, Statistics.

NEW ENGLAND

HEAVY CONSTRUCTION—BA

Mass., Pittsfield (BA 3/10)—City, Special Bd. Water Comm., City Comm. P. Wks., City Hall. Ashly Dam, pipe lines, earth filled dam, concrete spillway and 10 in. water mains, $700,000. Plans deposit $50. Metcalf & Eddy, 1100 Statler Bldg., Boston, engrs. CD 1/16.

HEAVY CONSTRUCTION—LB & CA

MASSACHUSETTS—Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston. Bids opened 2/17.

Callan Constr. Corp., 599 Hope St., Bristol, R. I., LB $742,599, est. $842,146, state hy. and bridge, Interstate Rte. 95, FA 1-95-4-917, Swansea. CD 2/6.

▲ MASSACHUSETTS—Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston.

Mass. Constructors, Inc., 421 Mass. Ave., Lexington, Mass., CA $675,136, hy. and bridge constr. and relocate Meadow Brook, I-W 95-6(2)68, Chelmsford-Lowell. CD 2/2, under LB.

Mass.—J. F. White Contg. Co., P.O. Box 358, Westwood, Mass., CA $1,288,000, hy. and bridge constr. Interstate Rte. 93, I-93-1(115)22, Andover-Methuen. CD 1/30, under LB.

BUILDINGS—LB & CA

▲ Vappi & Co., Inc., 240 Sidney St., Cambridge, Mass., LB Approx. $2,500,000, MEDICAL RESEARCH BLDG., East Concord St., BOSTON, MASS. Boston University, School of Medicine, 755 Commonwealth Ave., Boston, Mass. Bids Dec. 17. CD 11/24.

▲ City, Real Property Dpt., City Hall Annex, Boston, Mass., received no Bids Feb. 17, off street parking garage, Central and Kilby Sts., BOSTON, MASS., $1,500,000. M. A. Dyer Co., 24 School St., Boston, Mass., archt. CD 12/9.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—LB & CA

▲ PENNSYLVANIA—Pa. Hys. Dpt., 507 North Office Bldg., Harrisburg.

F. D. Kessler, Inc., Northumberland, Pa., CA $1,178,307, 16,531 ft. grade drain of separated 4 lane, hy. variable in width 1 bridges, galt. superstructures, L-R 1009-113, Clarion and Union Twps., Clarion and Jefferson Counties. Bids Dec. 30, awarded Feb. 17. CD 1/6, under LB.

▲† American Dredging Co., 12 S. 12th St., Philadelphia, Pa., CA $3,481,000, excavation of Delaware River opposite Andalusia, Bucks Co., Pa., and Delanco, Burlington Co., N. J., NAD-49-109-59-14, PENNSYLVANIA and NEW JERSEY. U. S. Eng., 2635 Arbutus Rd., Phila., Pa. Bids Jan. 6. CD 1/14, under LB.

BUILDINGS—LB & CA

Pellecchia Constr. Co., 50 Branford Place, Newark, N. J., CA $934,000, 4 story Garfield SCHOOL, addn., alterations, NEWARK, N. J. City, City Hall, Newark, N. J. Bids Feb. 16. CD 1/19.

Frank W. O'Connell, Inc., 329 Water St.—Binghamton, N. Y., CA $948,082, HIGH SCHOOL BLDG. for Montrose Consolidated Jt. School Dist., MONTROSE, PA. Pa. Pub. School Bldg. Auth., 101 S. 25th St., Harrisburg, Pa. Bids Jan. 22. CD 1/27, under LB.

SOUTH

BUILDINGS—BA

Miss., Tupelo—SCHOOL, BA 4/23—Tupelo Separate School Dist., 1 story, 67,000 sq. ft. brick, concrete, steel school, $800,000. F. L. Mahaney & Assoc., Millsaps Bldg., Jackson, archts. CD 10/2.

HEAVY CONSTRUCTION—LB & CA

▲† American Dredging Co., 12 S. 12 St., Phila., Pa., LB $2,551,960, channel dredging and turning basin, Tampa Harbor, ENG-08-124-59-59, FLORIDA. U. S. Eng., P. O. Box 4970, Jacksonville, Fla. Bids Feb. 12. CD 1/14.

▲ LOUISIANA—State Hy. Dpt., Rm. 307, Hy. Office Bldg., Baton Rouge. Bids opened 2/18.

Blount Brothers Constr. Co., 79 Commerce, Montgomery, Ala., LB $1,360,984, 0.24 mi. substructure, Red River Bridge at Alexandria, Rte. LA 3026, SP No. 252-06-12, FAP No. 16-4(15)41, Rapides Parish. CD 2/4.

▲ LOUISIANA—State Hy. Dpt., Rm. 307, Hy. Office Bldg., Baton Rouge. Bids opened 2/18.

La. T. Miller & Sons, Inc., 2002 Enterprise Blvd., Lake Charles, La., LB $1,592,275, grading 2 channel overpass structures, 0.745 mi., Lake Charles Expressway, Rte. I-10, SP No. 240-00-23, FAP No. I-10-1 (13), 90, Calcasieu Parish. CD 1/30.

La. L & A Contracting Co., Hy. 49 N. Bypass, Hattiesburg, Miss., LB $1,024,258, 6 conc. 2,975 mi. Shreveport-Blanchard Hy., Rte. LA 171, SP No. 95-01-07, FAP No. US-552 (1), FASP No. S-552 (2), Caddo Parish. CD 2/4.

BUILDINGS—LB & CA

H. J. Constr. Co., 1015 W. Amelia Ave., Orlando, Fla., CA $703,400, Maynard Evans HIGH SCHOOL, Pine Hills, ORLANDO, FLA. Orange Co. Bd. P. Instruction, 434 N. Tampa Ave., Orlando, Fla. Bids Jan. 12. CD 1/23.

MIDDLE WEST

BUILDINGS—LB & CA

Huber, Hunt & Nichols, 2450 S. Tibbs Ave., Indianapolis, Ind., CA $644,659, WAREHOUSE-SERVICE BLDG., Wilton Rd., CINCINNATI, O. John Shillito Co., 7th Race and Shillito Pl., Cincinnati, O. Bids Feb. 11. CD 2/18, under LB.

Don Buffer, Front and High Sts., Hamilton, O., CA Est. $900,000, 27 HOMES, Washington Park Terrace, HAMILTON, O. Meldon Homes, Front and High Sts., Hamilton, O.

▲ John Pesuit & Sons, Inc., 5199 Mayfield Rd., Cleveland 24, O., Own Forces, $5,600,000, 171 HOMES, off Wilson Mills Rd., HIGHLAND HEIGHTS, O. CD 11/15/57.

▲ S. N. Nielsen Co., 3059 W. Augusta Blvd., Chicago, Ill., CA $1,000,000, 3 story, brick Lawndale DIAL EXCHANGE BLDG., Ogden near Drake and St. Louis Aves., CHICAGO, ILL. Illinois Bell Telephone Co., 212 W. Washington Blvd., Chicago, Ill. Bids Jan. 6. CD 1/6.

WEST OF MISSISSIPPI

HEAVY CONSTRUCTION—BA

Tex., San Antonio—BA 3/24—City, City Hall, storm drainage, Woodlawn Hills, Dellview Area, Proj. 96, $673,730. Plans deposit $50, sanitary sewer lines, improv., S-3, $90,000. Plans deposit $50. M. R. Mitchell & Assocs., 206 San Pedro Ave., engrs. CD 12/19/57.

HEAVY CONSTRUCTION—LB & CA

† M. A. Garland Constr. Co., P. O. Box 147, Rapid City, S. D., CA $685,411, readiness crew bldg. and alert apron perimeter utilities, Ellsworth Air Force Base, ENG-25-066-59-66, RAPID CITY, S. D. U. S. Eng., 1709 Jackson St., Omaha 2, Neb. Bids Feb. 5, awarded Feb. 18. CD 2/11, under LB.

BUILDINGS—LB & CA

▲† Bob Eldridge Co., 3206 Strang, Kansas City, Kan., CA $1,098,524, FAMILY HOUSING, 27 units, Baudette Air Force Station, Minn.; 18 units, Odessa Air Force Station, Wash.; 14 units, Willmar Air Force Station, Minn.; MINNESOTA-WISCONSIN Procurement Office, 343rd Fighter Wing (ADEF), U. S. Air Force, 510 Fidelity Bldg., Duluth, Minn. Bids June 19. CD 7/3, under LB.

▲† Ross Management Corp., 10441 Bevis Ave., San Fernando, Calif., LB $3,199,923, Base Bid, 236 unit CAFE-ART HOUSING, Increment No. 2, Offutt Air Force Base, FORT CROOK, NEB. Procurement Office, Offutt Air Force Base, Omaha, Neb. Bids June 29. CD 5/22.

▲ Walsh & Burney Co., P. O. Box 5176, I-H 938 N. Flores St., San Antonio, Tex., CA Est. $1,300,000, OFFICE and COMMERCIAL BLDG., SAN ANTONIO, TEX. Kallison Properties, Morris Kallison, 136 Main Plaza, San Antonio, Tex. CD 2/18.

FAR WEST

HEAVY CONSTRUCTION—BA

▲† California—BA 3/17—U. S. Eng., 751 S. Figueroa St., Los Angeles. Santa Ana River Basin Carbon Canyon Dam and appurtenances, ENG-04-353-59-25, $4,500,000. CD 9/23.

▲† California—BA 3/24—U. S. Eng., 751 S. Figueroa St., Los Angeles. Imprv. East Twin and Warm Creeks Channel, Pacific Electric Railway Bridge to Central Ave., Santa Ana River Basin, San Bernardino, ENG-04-353-59-26, $1,000,000. CD 9/23.

BUILDINGS—BA

▲ Calif., Napa—JUVENILE UNIT—BA 3/24—State Div. Architecture, 1120 N. St., Sacramento, 93,000 sq. ft. juvenile unit, Napa State Hospital, Imola, W.O. 4007GC-13, $2,022,000. Plans deposit $100. CD 7/24/57.

HEAVY CONSTRUCTION—LB & CA

▲ CALIFORNIA—State Div. Hys., 120 S. Spring St., Los Angeles.

Calif.—E. L. Yeager Co., 1995 Agua Nansa Rd., Riverside, Calif., CA $1,043,306, 1.9 mi. 4 lane expressway U.S. Hy. 70-99 between 0.2 mi. and 2.4 mi. east of Redlands, incl. frontage roads, access ramps and bridge to carry Yucaipa Blvd. over Expressway, V111-S.B. 59D, 26-B, San Bernardino Co.

Calif.—Webb & White & Potashnick and W. J. Distell, 816 W. 17th St., Los Angeles, Calif., CA $6,272,685, joint venture, grading, paving 3.7 mi. Long Beach Freeway (State Sign Rte. 15) 4 lane and 13 structures between 0.3 mi. south of Santa Ana Freeway and 0.2 mi. north of San Bernardino Freeway, V11-LA-167, 168, 26-B, C, Manp., LA, D, ALH, Los Angeles Co. Bids Dec. 5. CD 2/9, under LB.

▲ CALIFORNIA—State Div. Hys., 120 S. Spring St., Los Angeles. Bids opened 2/19.

Calif.—Guy F. Atkinson Co., 23414 South Santa Fe Ave., Long Beach, Calif., LB $6,117,307, grading, paving to constr. 7.5 mi. 4 and 6 lane freeway, U.S. Hy. 101 (San Diego Freeway) and U.S. Hy. 101 Alt. (Cabrillo Hy.) between Avenida Ramona in San Clemente and 1.4 mi. north of State Sign Rte. 74 in San Juan Capistrano, incl. 11 traffic separation structures, V11-01a-2, 41-SCE, A, C, Orange Co.

Calif.—Fredericksen & Kassler, 212 13th St., Sacramento, Calif., LB $2,323,296, grade, cove to constr. 3.2 mi. 4 lane freeway and 4 structures between Pierce St. and Van Buren St. in Riverside on Riverside Freeway (US 91) Sign Rte. 18), V111-Riv.43-B, Riverside Co. CD 1/14.

▲ Guy F. Atkinson Co., Box 693, South San Francisco, Calif., LB $1,346,856, (11 bidders) overpass over Beale Ave., BAKERSFIELD, CALIF. Greater Bakersfield Separation of Grade Dist., 301 Monnet Bldg., Bakersfield, Calif. Bids Feb. 17. CD 1/23.

BUILDINGS—LB & CA

▲ Tolboe & Harlin, 5091 S. Main St., Salt Lake City, Utah, CA Est. $1,500,000, MFG. PLANT expansion, SALT LAKE CITY, UTAH, Wagner Bag Co., 24th & 8th W., Salt Lake City, Utah. Carpenter & Stringham, Cranston Bldg., Salt Lake City, Utah, archts.

▲ Cawdrey & Vemo, Inc., 3601 Fremont Ave., Seattle 3, Wash., LB $1,644,869, (9 bidders) Sears Roebuck Dist. STORE, RENTON, WASH. Robert L. Edwards, 1290 Bellevue Ave., South, Renton, Wash. Sears Roebuck & Co., 925 S. Homan St., Chicago, Ill. Jessee, Bids Feb. 12. CD 1/26.

▲ Cahill Bros., Inc., 350 Sansome St., San Francisco, Calif., CA $6,500,000, 2nd unit, 12 story, penthouse, bsmt., steel frame, concrete with, 2 story, entrance BANK, California and Leidesdorff Sts., SAN FRANCISCO, CALIF. American Trust Co., 464 California St., San Francisco, Calif. Ashley, Keyser & Runge, 268 Market St., San Francisco, Calif., archts.

CANADA

HEAVY CONSTRUCTION—LB & CA

ONTARIO—Dpt. Hys., Parliament Bldgs., Toronto.

Peel Constr. Co. Ltd., Box 1000, Brampton, Ont., CA $889,337, rein.-con. paving, granular base 5.123 mi. Hy. 401 from Hy. 10 westerly (58-657), Toronto. Awarded Feb. 13. CD 2/18, under LB.

(Continued on page 66)

PROJECTS COVERED

By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $53,000, other public works $88,000, industrial buildings $110,000; other buildings $400,000. Also Foreign projects of $1,000,000 and more in size of interest to American contractors.

By Regions & Classes of Construction
(In order of Listing)

BIDS ASKED
LOW BIDDERS
CONTRACTS AWARDED

New England
Middle Atlantic
South
Middle West
West of Mississippi
Far West

PROPOSED WORK

Water Supply
Sewers, Waste Disposal
Bridges
Streets & Roads
Earthwork, Waterways
Public Buildings
Mass Housing
Commercial Buildings
Industrial Buildings
Unclassified

In These Stages

PROPOSED WORK: Before and including appointment of engineers or architects.

BIDS ASKED: BA (new announcements only). For full calendar, see also preceding issues.

SOON LETS CONTRACT: SLC

LOW BIDDERS: LB On jobs below $500,000. In value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.

CONTRACTS AWARDED: CA Except awards to low bidders previously reported in low bidder stage.

CD dates shown are of Construction Daily Issue in which last previous report was published.

OWNERS, ENGINEERS, ARCHITECTS, CONTRACTORS are invited to report their new jobs for listing in these reports when they meet or exceed the size minimums shown above. Address these news releases to J. A. Mahoney, REPORTS, ENGINEERING NEWS-RECORD, 330 W. 42 St., New York 36, N. Y.

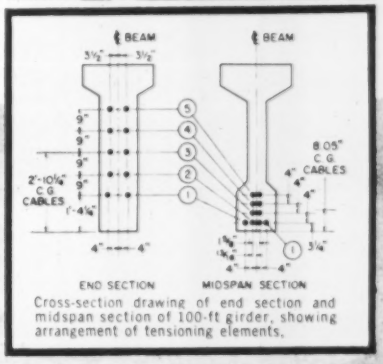
Symbols and Abbreviations Include:

† Federal Government
▲ Project of $1,000,000 or over
ENR Engineering News-Record
CD Construction Daily

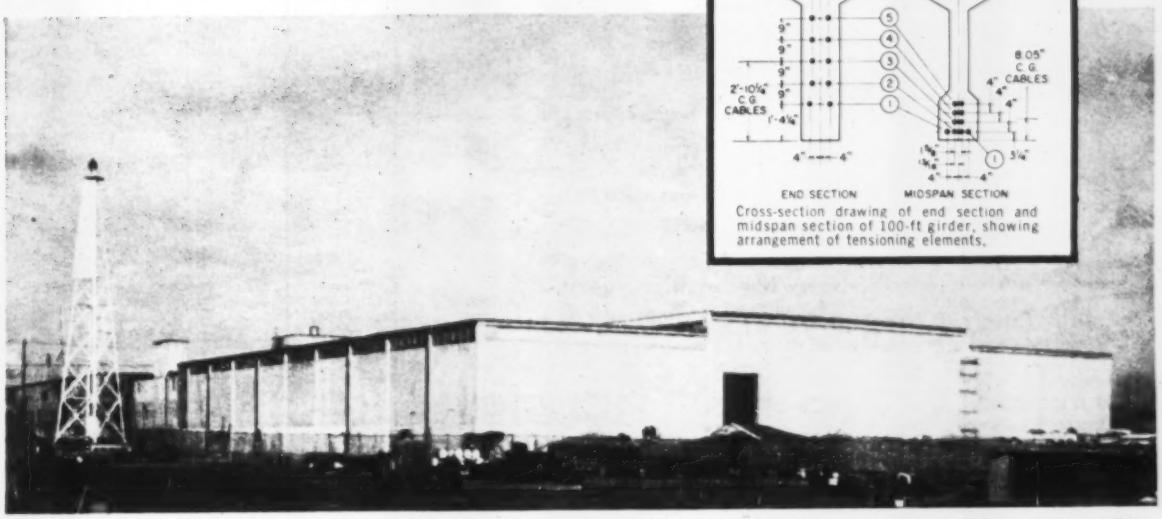
For additional reports see Construction Daily.

Architect-Engineer offers some impressive reasons why his firm chose Prestressed Concrete for Paper Storage Warehouse

Photo shows how 100-ft girder rests on column. End of 70-ft girder is positioned on seat seen at top of ladder, left.



Cross-section drawing of end section and midspan section of 100-ft girder, showing arrangement of tensioning elements.



Newman & Company Warehouse, embodying twelve 100-ft post-tensioned girders, twenty-two 70-ft post-tensioned girders and about 600 pre-tensioned double tee beams.
Architects and Engineers: Cronheim & Weger, Philadelphia, Pa. Contractor: Lauter Construction Company, Philadelphia, Pa. Prestressed Fabricators: Atlantic Prestressed Concrete Co., Trenton, New Jersey.

Because Nathan Cronheim, architect-engineer, has much to say about this structure, we quote him as follows: "The design of the new waste paper storage building for Newman & Company, Inc., manufacturers of paper board in Philadelphia, incorporates a number of relatively new techniques and processes in developing a more fire-resistant building and in expediting the handling of stored materials.

"The roof structure is composed of twelve 100-ft span and twenty-two 70-ft span post-tensioned girders. Each girder was post-tensioned with ten Freyssinet Cables composed of twelve .276" diameter Roebling wires. (See diagram). The approximately 600 double T's used in the roof structure are pre-tensioned, using the Roebling standard seven wire pre-tensioning strand. The great strengths resulting from this method allow the roof structure to be much shallower and lighter in weight than would be possible in other types of equally fire-resistant construction.

"The building is two hundred and forty-ft wide, made up of a center bay one hundred-ft wide and two side bays each seventy-ft wide. There are, therefore, girders one hundred-ft long in the center bay flanked on either side with girders seventy-ft long. Since the girders are spaced twenty-five ft on centers, the T's which span from girder to girder are almost twenty-five ft in length. As can be readily seen, due to the exceptionally long spans, it is necessary to use the higher strength materials mentioned to keep the dead weight of the roof structure to a minimum.

"Because of the prefabrication of so many of the elements of this building, such as the girders, roof plank, wall panels and many of the columns, the erection of the building moved very rapidly once the foundation work was completed."

Nothing makes a better case for the prestressed concrete method than the *architect's own words*. In all of the many years that Roebling has concerned itself with tensioning elements for prestressed concrete, we have found that its inherent benefits are best articulated by the architects and engineers who design for, and work with, prestressed concrete. During these years we have developed and accumulated a significant body of knowledge, data and experience that we will gladly share with you. An inquiry to Construction Materials Division, John A. Roebling's Sons Corporation, Trenton 2, New Jersey, bearing on any phase of prestressed concrete, will bring a prompt and fully documented reply.

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QUALITY CONSTRUCTION—Definitely superior value. Tough, rugged, dependable, yet precision-built.

ECONOMICAL—Low initial cost; low operating cost.
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(Continued from page 64)

LATIN AMERICA

HEAVY CONSTRUCTION—LB & CA

† NICARAGUA—Bureau P. Rds., Dpt. Commerce, Inter-American Hy. Div., Wash., D. C., U. S. A., Thompson Cornwall, 405 Lexington Ave., New York, N. Y., U. S. A. CA $729,700 special subbase, crushed aggregate base, prime coat and double application bit. surface treatment between Honduras Border and Corinto, Nicaragua Proj. 9-A. Bids Jan. 22, awarded Feb. 18. CD 1/28.

PROPOSED PROJECTS

WATER SUPPLY

▲ Colo., Denver—Bd. Water Comrs., 144 West Colfax, 11 mi. 78 in. pipe in place, Conduit 29, $5,000,000; 78 in. diam. pipe in place from Hillcrest to Monaco and Montview, Conduit 28 Part 2, $1,000,000; extend conduit 28 Part 3, 72 in. to 54 in. diam. from Hillcrest reservoir to Monaco and Montview, $1,000,000; channel changes and improvs. from East portal of Roberts tunnel towards Watertown on North Fork of Platte, $500,000; diversion dam on South Platte, $1,000,000; extend Conduit 20 from present diversion to new diversion 8,000 ft. 90 in. pipe in place, $1,500,000; filter plant, Marston Lake, $5,000,000; pumping plant, Marston Lake to pump water from Marston filter plant to Hillcrest reservoir, $1,000,000. R. B. McRae, ch. engr., Denver Bd. Water Comrs., engr. CD 11/19/57.

▲ Ill., Chicago—Dpt. Purchases, City Hall, South Dist. Water Filtration Plant addns., 4300 E. Chesterham Ave., 2 settling basins, 40 filters, low lift 150 MGD pump, $6,000,000. Bids about Fall, 1959. Columbus Ave. water tunnel, 14,000 ft., 12 ft. bore, 73 and Western Ave. to 84th and Kedvale, $4,750,000. Bids about Apr. 1. Geo. S. Salter, 320 N. Clark St., Zone 10, engr. CD 1/30/52.

▲ Tex., Dallas—City, City Hall, Forney Reservoir, East Fork Trinity River for water supply, 1.8 mi. north of U. S. Hy. 80, Dallas and Kaufman Counties, $27,400,000.

▲ Wisconsin—City of Glendale, Village of Fox Point and Whitefish Bay, water supply, 36 mgd water treatment plant, intake, reservoir, $4,500,000. Consoer, Townsend & Assoc., 360 E. Grand Ave., Chicago, Ill., consult. engrs.

STREETS AND ROADS

▲ Ill., Decatur—City, City Hall, voted $2,500,000 bonds Feb. 10, street improvs. CD 1/14.

▲ NEW YORK—State Dpt. P. Wks., State Office Bldg., Albany.
Broome Co.—reconstr. 25 mi. Rte. 17, Five Mile Point, Binghamton to Deposit, FAI Project, $7,000,000.
Orange, Dutchess and Putnam Counties—70 mi. superhighway from Port Jervis eastward to Connecticut line near Danbury to be called Rte. 84, FAI Project, $150,000,000.

▲ Tex., Victoria—City, City Hall, street paving, $2,000,000.

EARTHWORK, WATERWAYS

▲ † Tennessee—Soil Conservation Service, Dpt. Agriculture, U. S. Courthouse, Nashville, 13 dams and dredging 16 mi. channel, Jennings Creek Watershed, flood protection, Celina, Gainesboro, Lafayette, Clay, Jackson and Macon Counties, $2,149,792.

▲ Tex., Victoria—City, City Hall, drainage (open and closed), $4,000,000.

LATIN AMERICA

▲ Cuba—RESEARCH CENTER—Corporation, c/o Dr. Rudolph T. Wagner, 7900 Harbor Island, North Bay Village, Fla., U. S. A., plans by Dr. Carlos Perez, Colombia, South America, medical research center, incl. hospital, research bldg., residences and facilities, Isle of Pines, near here, $2,000,000-$3,000,000. Watson & Duetschman, 811 Chamber of Commerce Bldg., Miami, Fla., U. S. A., consult. engrs.

FOREIGN

▲ CAMBODIA—Ministere Des Travaux Publics, Phnom Penh.
1,800 ft. highway bridge over Tonle Sap (Tonle Lake) near Phnom Penh, $3,400,000. Contractors must file applications by May 1.

PUBLIC BUILDINGS

▲ Calif., Charter Oak (Br. Covina)—SCHOOLS—Charter Oak School Dist., 5427 N. Sunflower Ave., Covina, voted $2,500,000 bonds Feb. 10 and approved $6,000,000 State Loan for school constr. CD 1/16.

▲ Calif., Los Angeles—JAIL—Bd. Supervs. Los Angeles Co., Hall of Records, plans by William Allen, 6112 Wilshire Blvd., Los Angeles; A. C. Martin & Assocs., 344 S. Beaudry St., Los Angeles; Charles Luckman & Assoc., 8544 Sunset Blvd., Los Angeles, and Kenneth S. Wing, 40 Linden Ave., Long Beach, Central Jail, Ave. 20 and the Los Angeles River, Broadway and Spring south to North Main, $19,450,000. CD 11/11.

▲ Calif., Santa Ana—HOSPITAL—Bd. Supervs. Orange Co., Courthouse, plans by William I. Faulkner, Spurgeon Bldg., Orange County General Hospital, $5,000,000. Wheeler & Gray, 2033 W. 7th St., Los Angeles, consult. engrs. CD 7/2.

HOW TO HANDLE WET JOBS

SINCLAIR PIPELINE
East Chicago, Ill.

Contractor: O. R. Burden Const. Co.

WELLPOINT PUMPS HANDLE 22 FT SUCTION LIFT

LOWERING 16 ft of water at this lift would ordinarily mean placing wellpoint system on a berm below ground. Actually, as photo shows, results were achieved in the simplest way, without additional excavation, the wellpoint line and pumps working from street level. Other noteworthy items revealed by the photo include: (a) pre-drainage with wellpoints on only one side of wide trench; (b) the open-cut method, eliminating costly sheeting.

• The foregoing are typical of the efficiencies of the Griffin Wellpoint systems (several used continuously) on this vast project which involved mile on mile of digging, with the majority of the pipelines laid far below ground water table in deep trenches containing water-bearing sands. Progress rate? Even in many of the swampland sections, it topped 500 ft per day. For "quick-dry" . . . specify . . . Griffin.

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W. Palm Bch., Fla. • Hammond, Ind.
In Canada: Construction Equipment Co., Ltd.
In Venezuela: Drew Bear & Sons C.A.

▲† Colo., Pueblo—SHOP—U. S. Eng., 1709 Jackson St., Omaha, Neb., shop bldg., $2,000,000. Phillips-Carter-Osborn, Inc., Insurance Bldg., Denver, consult. engr. CD 2/1/56

▲ Conn., Middletown—SCHOOL—State P. Wks. Dpt., 165 Capitol Ave., Hartford, plans by Seb. J. Passanesi, 1st Court St., Vinal Regional Technical School, Long Hill, $1,950,000. CD 11/30/55

▲† Del., Dover—HOUSING—Procurement Officer, Dover Air Force Base, plans by Pope & Kease, 1116 West St., Wilmington, 252 unit Capehart Housing, Dover Air Force Base, $2,000,000.

▲† Ill., Carbondale—PRISON—U. S. Bureau of Prisons, 1st St., between Indiana Ave. and D. St., N.W., Wash., D. C., plans by Hellmuth, Obata & Kassabaum, Inc., 315 N. 10 St., St. Louis 1, Mo., Federal Maximum Security Prison, Crab Orchard Lake National Wild Life Refuge area, $10,000,000. No appropriation.

▲ La., Monroe—DORMITORIES—Northeast Louisiana State College plans by King Stubbs, 506-08 Burnhardt Bldg., women's dormitory; plans by Rivers & Heuer, 512 Ouachita National Bank Bldg., Box 52, men's dormitory, $2,000,000. (Correction—names and addresses of architects). CD 1/15

▲ Mich., Coldwater—POWER PLANT—City, City Hall, bond election Apr. 9, power plant, $7,000,000.

▲ Minn., International Falls—SCHOOL—Bd. Educ., $2,000,000 bond election May 19, Senior High School, Melander, Fugerson & Assocs., 603 Ailworth Bldg., Duluth, archts. CD 4/2

▲† Mont., Great Falls—HOUSING—U. S. Eng., City-County Airport, Walla Walla, Wash., plans by McIver, Hess & Haugsjaa, archts., Strain Bldg., and Page & Warner, assoc. archts., 1512 4th N., 400 unit Capehart Housing, Malmstrom Air Force Base, $6,500,000. CD 3/12/58, under Airports.

▲ N. Y., Albany—SCHOOL—Bd. Educ., 141 Western Ave., school, South Pearl and Franklin Sts., $2,000,000.

▲ N. C., Chapel Hill—UNIVERSITY IMPROVEMENTS—University of North Carolina, men's dormitory, $1,750,000; Geology Geography Bldg., $750,000; Botany Bldg., $750,000; Foreign Languages Bldg., $750,000.

▲ O., Newark—SCHOOLS—Health Local School Dist., bond election May 26, schools, $1,920,000.

▲ O., Youngstown—HOUSING—Youngstown Metropolitan Housing Auth., 976 W. Federal, plans by Frank W. Smith & Assocs., Schaeen-Wagner Bldg., 350 unit housing, $3,000,000. CD 1/29

▲ Pa., Morganza—STATE INSTITUTION—General State Auth., 18th and Herr Sts., Harrisburg, plans by Cecil-Flynn, archts.-consult. engrs., 445 Shaw Ave., McKeesport, 3 ward bldgs., clinic, kitchen and personnel dining rooms, remodeling bldg., State Institution for Dpt. Pub. Welfare, $9,230,000.

▲ Pa., White Haven—WARD, etc.—General State Auth., 18th and Herr Sts., Harrisburg, plans by Lyle F. Boulware & George M. Ewing Co., associated archts., Fidelity-Phila. Trust Bldg., Phila., (1st phase) 4 ward bldgs., central kitchen and personnel dining bldg., utilities and existing water well exten., and 6 new wells, $5,000,000.

▲ Tenn., Knoxville—FINE ARTS, etc.—University of Tennessee, Knoxville, fine arts bldg., mechanical engineering bldg., $15,000,000. Malcolm Rice, c/o owner, staff engr., CD 8/30/43.

▲ Tenn., Nashville—DORMITORY, etc.—State of Tenn., Dpt. Institutions, Centennial Blvd., dormitory, refectory, shops, gymnasium, etc., Agricultural and Industrial School, $4,000,000. CD 1/18/57.

▲ Tex., Beaumont—HOSPITAL—City of Beaumont and Jefferson County, City Hall, 150-bed Beaumont Municipal Hospital, $2,250,000.

▲ Wyo., Laramie—POWER PLANT, etc.—University of Wyoming, Campus, steam and electric power facility imprvs., $1,009,800, 252 married student apartments $1,685,969, commerce and industry bldg., $1,261,408, student health and college of nursing, $918,000. CD 12/30; 400 women's brick dormitory, $1,602,978, two 400 men's dormitory, central food service $3,718,134. CD 12/31/57.

▲ Ont., Toronto—HOME FOR AGED AND HOSPITAL—Municipality of Metropolitan Toronto, 67 Adelaide St., plans by Howard D. Chapman, 61 Avenue Rd., 7 story, semi-circular shaped home for aged and general hospital, $4,685,000.

▲ Ont., Toronto—ARTS—University of Toronto, Simcoe Hall, plans by John B. Parkin Assocs., 1500 Don Mills Rd., arts bldg., St. George St., $5,800,000.

COMMERCIAL BUILDINGS

▲ Ala., Birmingham—HOME—Methodist Churches of Alabama and West Florida, 1801 6 Ave., N., plans by Pearson, Tittle & Norrows, First National Bank Bldg., Montgomery, home for aging, $3,000,000 (1st unit $1,000,000).

▲ D. C., Wash.—HOSPITAL—Greater Southeast Community Hospital Foundation, Inc., Ring Bldg., plans by Sherlock, Smith & Adams, 303 Washington Ave., Montgomery, Ala., 250-bed hospital, S. E. Washington, $6,000,000. Bids in 1960. CD 3/6/56.

▲ Fla., Jacksonville Beach—RESIDENCES—Amson Homes, Inc., 111 N. 3 St., 324 residences, Hyde Park Subdivision, $3,000,000. Simmerson, Bell & Axel, 217 W. Forsyth St., Jacksonville, consult. engrs.

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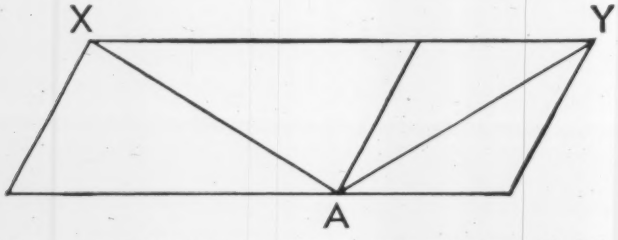

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▲ Ky., Paducah—SHOPPING CENTER—Jack Keller & Elliott Moffatt, Paducah, shopping center, $2,000,000.

▲ N. Y., Brooklyn—HOSPITAL—Lutheran Medical Center, 4520 Fourth Ave., Brooklyn 20; plans by Rogers & Butler, 219 E. 44th St., New York, Zone 17; 5 story hospital and altering existing bldg. at site, $2,000,000.

▲ N. Y., New York—APARTMENT—Malan-Dean Corp., 2 Park Ave., Zone 16; plans by Sylvan Bien, 342 Madison Ave., Zone 17; 20 story apartment, 1184-99 First Ave., $3,000,000. CD 10/24.

▲ O., Cincinnati—HOUSES—Murphy Bros., Inc., 7945 Hamilton Ave., 400-1½ story, burnt brick, cinder block houses, Plainfield and Glendale-Milford Rds., $7,000,000. Akers & Graf, Linton St., consult. engrs.

▲ O., Kettering—HOSPITAL, etc.—Montgomery Co. Foundation for Research and Educ., 131 N. Ludlow St., Dayton; Kettering Memorial Medical Center, incl. hospital, medical research bldg. and health museum; near Big Hill Rd. and Southern Blvd., northwest of Stroop Rd., $4,000,000.

▲ O., Youngstown—APARTMENT—Leroy D. Kendis, 19501 N. Park, Cleveland, 12-192 unit apartment, Lincoln Park, McCartney Rd. and Keystone Ave., $2,000,000.

▲ Pa., Fort Washington—SCHOOL BLDGS.—Germantown Academy, School Lane and Green St.; plans by Howell Lewis Shay & Assocs., Packard Bldg., Phila., school bldgs., $3,000,000. CD 12/10.

▲ Pa., Phila.—PARKING GARAGE—University of Pennsylvania, 1025 Walnut St.; plans by Wallace & Warner, archts.-consult. engrs., Lancaster and Martin Aves., Bryn Mawr; parking garage, 34th St. and Convention Ave., $2,000,000.

▲ S. C., Greenville—HOSPITAL—St. Francis Hospital, Vardry Heights; 250-bed hospital, $2,500,000.

▲ Tenn., Nashville—SUBDIVISION—Miller Kimbrough, A. H. Johnson, H. H. Richardson, 416 Union St., 442 acre subdivision development containing between 1100 and 1200 homes incl. roads, water sys., sewage disposal plant, $15,000,000.

▲ Tex., San Antonio—APARTMENT-HOTEL, etc.—Don Danvers, 5307 Broadway Ave.; plans by Bartlett Cocke, 3501 Broadway Ave.; proj. archt., 10 story apartment-hotel, $4,000,000; auto parking garage, $250,000; swimming pool, $90,000. CD 12/16/57, under Tex., Alamo Heights.

▲ W. Va., Weirton—HOMES—Barone Realty Service, Weirton; 1,200 homes in Weirton Heights, $17,000,000. Constr., 1959.

INDUSTRIAL BUILDINGS

▲ Ill., Bellwood—INDUSTRIAL—Gottlieb & Ralph, 100 W. Monroe St.; plans by Ralph Stetzel, 100 W. Monroe St., Chicago; Zone 3; 225,000 sq. ft. industrial bldgs., 25th and Grant St., $2,000,000.

▲ Ind., Chesterton—STEEL SHEET MILL, etc.—National Steel Corp., Grant Bldg., Pittsburgh, Pa.; steel sheet mill, electrolytic tinplating and galvanizing plants; Porter Co. (near here), $200,000,000.

▲ Mass., Lexington—HEADQUARTERS—Raytheon Mfg. Co., Foundry St., Waltham; plans by Anderson, Beckwith & Haible, 11 Beacon St., Boston; executive hdqtrs. bldg. and research park; Rtes. 2 and 128, 38.50 acres, $2,000,000. Cabot, Cabot & Forbes, 141 State St., Boston, engrs. CD 10/6.

▲ Minn., Hoyt Lakes—PELLETIZING FURNACES—Pickands Mather & Co., mngr. of Erie Mining Co., 503 Oliver Bldg., Duluth; 2 pelletizing furnaces for Mesabi Nugget taconite pelletizing plant, $3,500,000; engrs., owner, 1960.

▲ N. C., Asheville—PLANT—Ball Bros. Co., Muncie, Ind.; one story, 450,000 sq. ft. glass container mfg. plant, $3,000,000.

▲ Pa., Center Square—RESEARCH CENTER—Philco Corp., Abbottsford Rd. and Wissahickon Ave.; plans by Kessler & Weinstein, 30 S. 15th St., Phila.; research center, 24 laboratories, $2,500,000.

▲ Tex., Denison—PLANT—Pillsbury Mills, Inc., Denison, plant, $2,000,000.

▲ Va., Falls Church—PLANT, etc.—Melpar, Inc., 7700 Arlington Blvd.; plans by Perry, Duncan, 121 E. 60th St., New York, N. Y.; 5 story, 120,000 sq. ft. electronic research plant and office addn., $2,000,000. Bids in Spring.

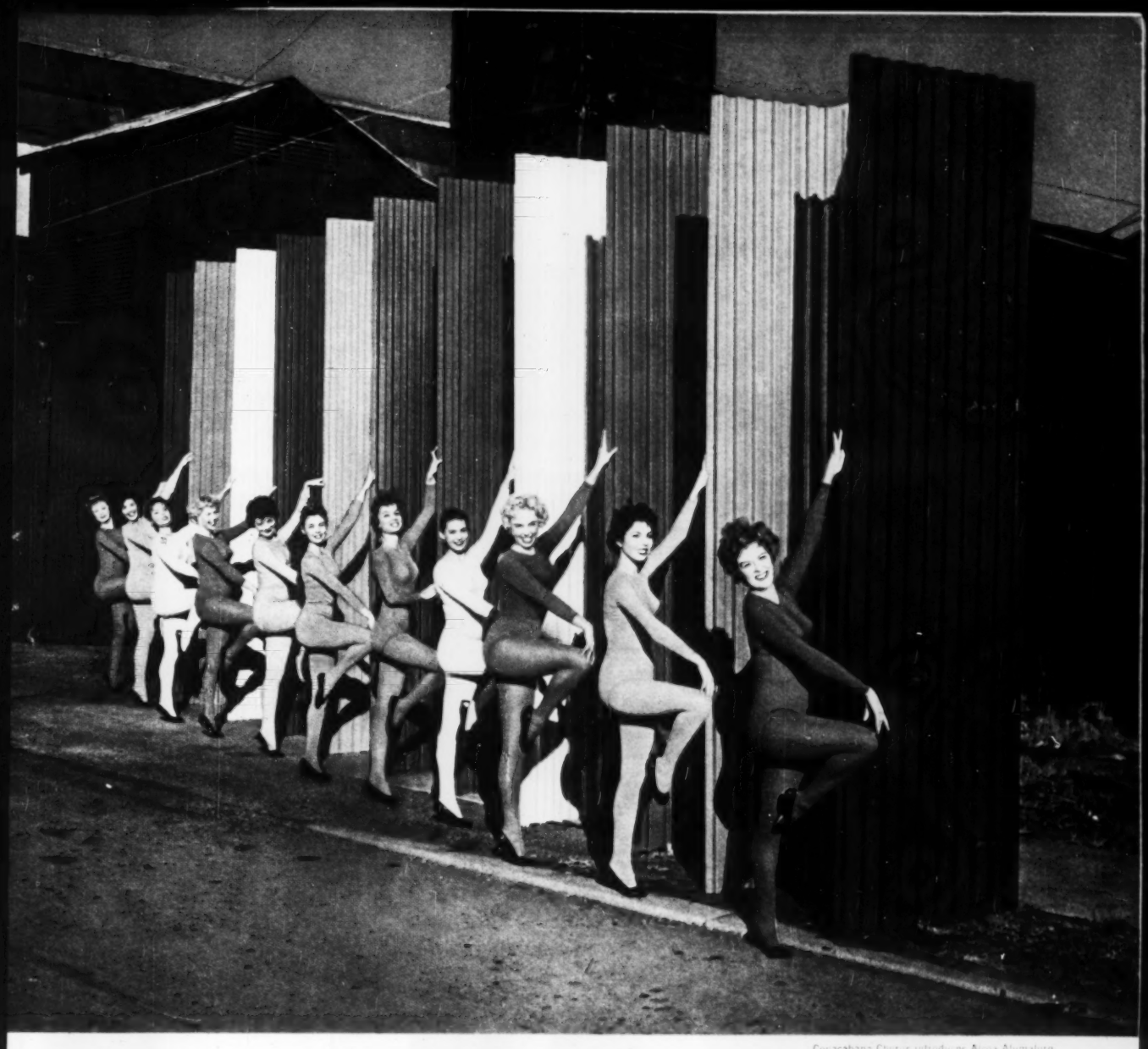
▲ Wash., Kennewick—PLANT—Burlen Hills Co., Wallace, Idaho; fertilizer plant, $8,000,000. Dow-Dillard, Inc., 2400 Gilgstock St., Oakland, Calif., consult. engrs. CD 11/6.

▲ W. Va., Weirton—RESEARCH CENTER, etc.—Weirton Steel Co., Subsidiary of National Steel Corp.; research center and office at plant, Cove Rd.

UNCLASSIFIED

▲ Conn., Hartford—BROADCASTING CENTER—Travelers Broadcasting Service Corp., 17 Central Row; plans by Kenney & Bowers, 341 Nassau St., Princeton, N. J.; 60,000 sq. ft. Broadcasting Center, Front St. (by Rear) Station WTIC and Television Station WTIC-TV, Channel 3, $2,000,000.

▲ O., Cincinnati—UNDERGROUND PARKING GARAGE—City, City Hall; plans by A. M. Kinney, Inc., 2905 Vernon Pl., 1,867 car underground parking garage, north and south wing under north side Fountain Sq., $6,390,000; 1,216 car underground parking garage under Fountain and Government Squares, $5,124,000; 81 car underground garage under Federal Bldg., Main St., $4,000,000.



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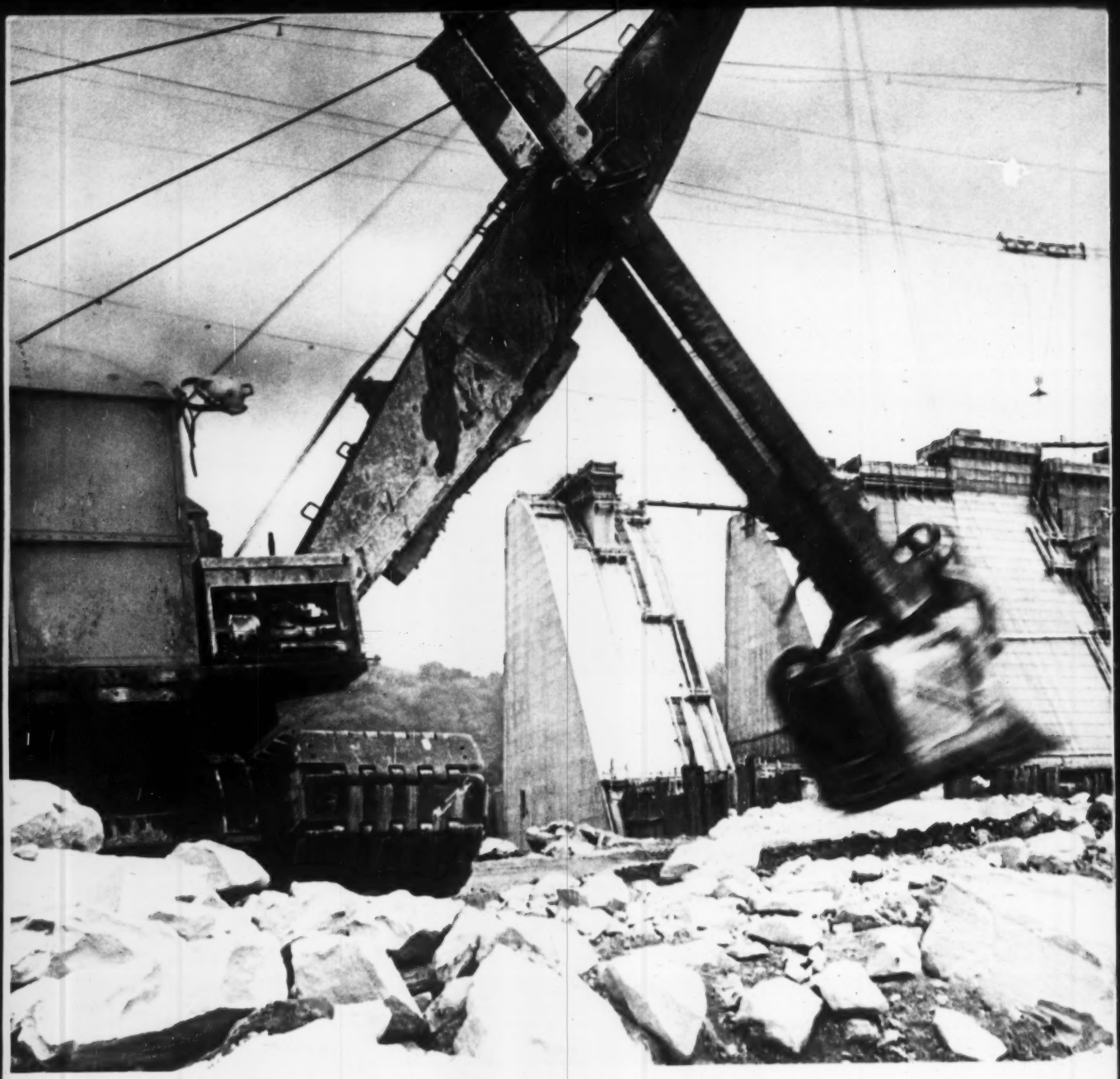

At $30,000,000 Sutton Dam, Gulf fuels and lubricants help

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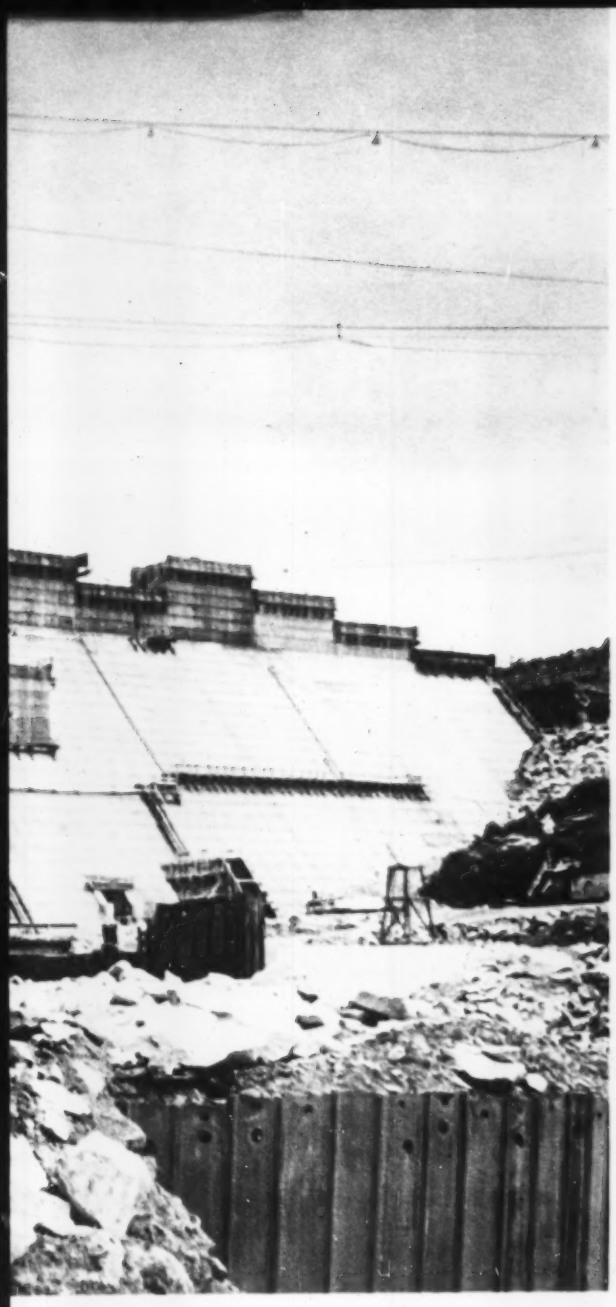
"Our dozers, cranes, power shovels and dump trucks have been running on Gulf fuels and lubricants for over 2 years on this project. We're right on schedule, and we haven't had a mechanical delay attributable to fuel performance or lubrication in any of this equipment."

That's the report from Leon H. "Freck" Freckleton, Mechanical Superintendent of the Arundel-Dixon-Hunkin team of contractors now in their third year of building the new $30,000,000 Sutton Dam project on the Elk River near Sutton, West Virginia.

The joint contractors, working under the supervision of Mr. J. H. Hay, General Superintendent, are: Arundel Construction Co. of Baltimore, Md.; L. E. Dixon Construction Co. of San Gabriel, Calif.; and the Hunkin-Conkey Construction Co. of Cleveland, Ohio.

The new Sutton Dam is another vital link in the flood control system for the Ohio River Basin. It is a project of the First Corps of Engineers, U.S. Army. In the event of flood conditions, this dam is expected to keep the crest of the Elk River to 15 feet, as compared with a 40-foot crest that caused 21 million dollars damage in the disastrous flood of 1861.



On-the-job lubrication at Sutton Dam project. Here a lube truck pulls up to a dozer for a track lube job with Gulflex A, a lithium base multi-purpose grease that resists heat, water, oxidation, rusting.

J. H. Hay, right, General Superintendent at Sutton Dam project, discusses fueling and lubricating schedules with John Hindsley, Gulf Sales Engineer.

keep project on schedule . . .

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CONSTRUCTION REPORTS

Second Section

NEW ENGLAND

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
STREETS AND ROADS
March 16 Connecticut

BUILDINGS—BA

▲† Me., Brunswick—HOUSING—BA 3-31—Dist. P. Wks. Office, First Naval Dist., 495 Summer St., Boston 10, Mass., 277 housing units, Naval Air Station, NBy (CH)-22978, Spec. 22978-58, $4,293,500, CD 9-17.

HEAVY CONSTRUCTION—LB & CA

▲ Litchfield County Homes, Inc., 187 Church St., Torrington, Conn., Owner Builds, $4,000,000, 400 HOUSES, Gungywamp Rd., GROTON, CONN.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
STREETS AND ROADS
March 10, 12, 17 New Jersey

HEAVY CONSTRUCTION—LB & CA

▲ NEW YORK—Dpt. P. Wks., State Office Bldg., Albany, D. A. Collins Constr. Co., Inc., Box 191, Mechanicville, N. Y., CA $4,623,722, Interstate Rte. 502 (Rte. 9 to North Bank of Hudson River), Glens Falls-Saratoga, Pt. 1, S.H. 58, Spiers Falls County Rd. 24, Spiers Falls Road-Redmond Rd., connection and Butler Rd., Rte. 87, FISH 58-19, Proj. 1-1119 (24), Saratoga and Warren Counties. Bids Dec. 30. CD 12-13, under LB.

▲ NEW YORK—State Dpt. P. Wks., State Office Bldg., Albany, N. Y.—L. G. DeFelice & Son, Inc., North Haven, Conn., CA $2,122,275, c. conc. 2.06 mi., 1.81 mi. access road, 3 fly separations incl. 231 ft., 191 ft., and 205.3 ft. I-beams City of Schenectady, Crosstown connection, Interstate Rte. connection 550, Schenectady crosstown to Thruway New York State Thruway, Mohawk Section, Interchange No. 25 connection, Rte. 890, Proj. I-I-IG-323(13), Albany and Schenectady Counties; N. Y.—Carmen-Greene Site Corp. & Meadow Brook Nurseries, Inc., 127 Lafayette Rd., Englewood, N. J., CA $792,282, landscaping, fencing, misc. work 3.84 mi. Interstate Rte. connection 511, New York State Thruway, New England Section-Sub. NE 5, Westchester Ave. to New York City line, Contr. 3 B, Proj. I-1068-211, Bronx Co.; N. Y.—"Les" Strong Constr. Co., Whitney Point, N. Y., CA $697,075, b. conc. Type 2B, 1.02 mi., and misc. work 0.01 mi., City of Norwich, Arterial Hy., (South and North Broad St.), Rte. 12, Proj. (I-B78-3), Chenango Co.; N. Y.—C. D. Perry & Sons, Inc., foot of Monroe St., Troy, N. Y., CA $667,933, c. conc. 0.32 mi., access roads 0.29 mi., and 330 ft. plate girder bridge, Rte. 13, South Bay-Vienna, S. H. 8219, Proj. F-384-(4), Oneida Co.; N. Y.—D. W. Winkelman Co., Inc., 205 Rainbow St., Syracuse, N. Y., CA $3,784,170, c. conc. pavement (variable width 37 to 52 ft.), and work incl. 2 fly separations, Rte. 49, Mohawk River-Rome, S. H. 960, Mohawk River Road-Floyd, S. H. 295, Mohawk River Road-Marcy, S. H. 296, Proj. (I-518(6) and F-518(6), Oneida Co.; N. Y.—Lizza & Sons, Inc., 152 South St., Oyster Bay, N. Y., CA $1,304,988, b. conc. 4.62 mi., 0.08 mi. misc. work, Wantagh Parkway extension, Pt. 1, R. W. 40-2, Proj. 1-1-1(2), Nassau Co.; N. Y.—Slattery Contg. Co., Inc. & Slattery Tunnel Corp., 46-06 54th St., Maspeth 78, N. Y., CA $8,480,193, c. conc. pavement, bridge (variable width 1.83 mi.), grading and drainage 0.74 mi., misc. work, Interstate Rte. connection 513, Horace Harding Expressway Section, II, 19th St. to Oceania St., Interstate Rte. Connection 513, Clearview Expressway, 1st Ave. to 56th Ave., Proj. I-Rch-1(16) and I-1112(4), Queens Co.; N. Y.—Stanley DiStefano & Sons, Inc., 594 Broadway, Watervliet, N. Y., CA $983,822, bit. macadam 8.19 mi., 0.05 mi. misc. work, Academy-Jay Center Proj. S.240 (3)—Wyoming Co., Bids Dec. 11, Grand total $18,742,728, CD 12-12, under LB.

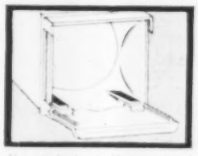
BUILDINGS—LB & CA

▲ Wilaka Constr. Co., Inc., 11 E. 44 St., New York 17, N. Y., CA $5,845,000, Contr. 5, & 6, general constr., Bailey Gardens HOUSES, Proj. NYC-321, Fach Blvd., 147th St., 116th Ave. to 145th St. and New York Blvd., Bailey Park HOUSES, Proj. NY-5380, Long Island Railroad, Fach Blvd., New York to Foch Blvds., in area by 116th Ave., Bedell St., New York Blvd., Foch Blvd. to New York Blvd. and 159th St., Queens Boro, JAMAICA, N. Y., New York City Housing Auth., 299 Broadway, New York 7, N. Y., Grand total $7,022,900, Bids Oct. 21, CD 10-23, under LB.

Heating Maintenance Corp. of New York, 220 E. 118 St., New York 51, N. Y., CA $547,000, Contr. 7, heating for Baisley Gardens Housing and Bayley Park Houses (Jamaica, N. Y.).

(Continued on page 75)

Low-cost, permanent Hamilton-Pack Inter-Lock files offer instant-access protection to any size and type of drawing — insure maximum space utilization, effortless expansion



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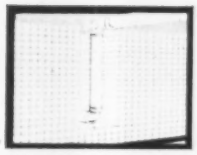

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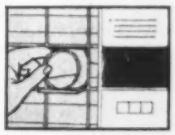

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HAMILTON MANUFACTURING COMPANY, TWO RIVERS, WISCONSIN

30,000 feet of curb and gutter are being erected by Neel Contracting along a 4-lane federal highway near Atlanta, Georgia. Neel used 1,000 feet of Blaw-Knox Steel Form set-up on the 8¾ mile job.

"I have never seen a form that could take as much punishment"

"We have been using Blaw-Knox forms for ten years, and 80% of our original order is still in use," says Charles Neel, owner of the Neel Contracting Company, Atlanta, Georgia.

Prominent in curb and gutter construction for 25 years, Mr. Neel is convinced that, "Blaw-Knox Universal Steel forms provide the most economical means of curb and gutter forming.

"Our ten-man crew lays from 400 to 550 feet of curb and gutter per eight hour day. Over a period of ten years the 80% re-use factor represents an economy that can't be counted in dollars and cents," he adds.

Curb and gutter specialists like Neel have relied on Blaw-Knox Universal Forms for economy, efficiency and quality. Their rugged construction, and high re-use factor have earned them preferred status. Blaw-Knox Universal forms are available for every type of curb, curb and gutter, integral curb or sidewalk job. Your Blaw-Knox distributor can help you pick just the right form from straightways to the most complicated layouts.

BLAW-KNOX

BLAW-KNOX COMPANY

Construction Equipment
300 Sixth Avenue
Pittsburgh 22, Pennsylvania

(Continued from page 73)

Lipsky & Rosenthal, Inc., Lexington Ave. and 115th St., New York 29, N. Y., CA $632,900, Contr. 9, plumbing for Baisley Gardens Housing and Baisley Park Houses (Jamaica, N. Y.).

▲ **Arthur H. Padula**, 81A Mount Vernon Place, Newark, N. J., Owner Builds, $10,000,000, 40 story OFFICE, 536 Broad St., NEWARK, N. J. Romolo Bottelli, Jr., 1678 Springfield Ave., Maplewood, N. J., archt.

▲ **Blake Constr. Co., Inc.**, 33 E. St. S. W., Wash., D. C., LB, $5,918,000 (16 bidders), Sibley Memorial HOSPITAL and Lucy Webb Hayes SCHOOL of NURSING, MacArthur Blvd., and Loughboro Rd., N. W., WASH., D. C., Sibley Memorial Hospital, 1140 N. Capitol St., Wash., D. C. Bids Feb. 18. CD-2-17.

SOUTH

HEAVY CONSTRUCTION—BA

▲ **Ala., Birmingham**—HOUSING—BA. 3-31—Birmingham Housing Auth., 600 N. 23 St., 488 low-rent apartment, Tuxedo Court area, $4,000,000. Warren, Knight & Davis, Protective Life Bldg., archts. CD 9-29-55.

HEAVY CONSTRUCTION—LB & CA

▲ **MISSISSIPPI and ARKANSAS**—Mississippi State Hy. Dpt., Jackson, Miss., and Arkansas State Hy. Comm., Little Rock, Ark.:

Miss. and Ark.—**Kansas City Bridge Co.**, 298 Broadway, Kansas City, Mo., and **Guy H. James Constr. Co.**, 4901 N. Sewell, Oklahoma City, Okla., CA $2,629,988, Job 11631, Contr. 1, sub-structure, superstructure and embankment work for Mississippi River Bridge at Helena, Phillips Co., Ark. and Coahoma Co., Miss., CD 12-1, under LB; CA $569,246, Job 11632, Contr. No. 2, approaches to River Bridge, substructures consisting of piers and abutments for approaches to River bridge, Helena, Phillips Co., Ark. and Coahoma Co., Miss. CD 12-2, under LB;

Miss. and Ark.—**Peter Kiewit & Sons Co.**, 1024 Omaha National Bank Bldg., Omaha, Neb., CA $599,620, Job 11633, Contrs. 3 and 6, relief structures, substructure and superstructure consisting of constr. piers and abutments and fabrication and erection of superstructure and deck at Helena, Phillips Co., Ark. and Coahoma Co., Miss.;

Miss. and Ark.—**John F. Beasley Contr. Co.**, Merchantile Bank Bldg., Dallas, Tex., CA $3,664,238, Job 11634, Contr. 1, sub-structure superstructure and embankment work for Mississippi River Bridge at Helena, Phillips Co., Ark. and Coahoma Co., Miss. CD 12/1, under LB; CA $856,956, Job 11635, Contr. No. 5, approaches to River Bridge, superstructure consisting of fabrication and erection of superstructure metalwork and deck constr. for approaches to Mississippi River Bridge, Helena, Phillips Co., Ark. and Coahoma Co., Miss.;

Miss. and Ark.—**R. B. Potashnick Constr. Co.**, Box 423, Cape Girardeau, Mo., CA $818,033, Job 11637, Contr. No. embankment and paving 1.23 mi. for Mississippi River Bridge at Helena, Phillips Co., Ark. and Coahoma Co., Miss. CD 12-2, under LB. Bids Nov. 25. Grand total $9,138,082.

▲† **Traylor Bros., Inc.**, Station B, Box 66, Evansville 12, Ind., CA $4,481,708, reconstr. widening canal, sewer, exten., etc., Louisville Locks and Dam, Ohio River, ENG-15-029-59-33, KENTUCKY and INDIANA. U. S. Eng., P. O. Box 59, Louisville 1, Ky. Bids Feb. 11, awarded Feb. 20. CD 2-13, under LB.

BUILDINGS—LB & CA

▲† **Charles H. Tompkins Co.**, 1737 K St. N.W., Wash., D. C., LB $32,810,000 (13 bidders), HEADQUARTERS BLDG., Central Intelligence Agency, Proj. 44122, LANGLEY, VA., General Services Admin., General Services Bldg., 19th and F Sts. N.W., Wash. 25, D. C. Bids Feb. 25. CD 2-9.

Otis Elevator Co., 1012 20th St. N.W., Wash., D. C., LB, $1,088,512 (3 bidders), Elevator Plant for CIA Headquarters Bldg., (Langley, Va.).

▲ **James C. Lewis**, 2713 Shades Crest Rd., Birmingham, Ala., Owner Builds, $5,000,000, 226 brick HOMES, Roebuck Oakes Estates, BIRMINGHAM, ALA. CD 2-24-56.

MIDDLE WEST

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES
March 11 Illinois
STREETS AND ROADS
March 11 Illinois

BUILDINGS—BA

▲ Wis., Milwaukee—SCHOOL—BA. 4-20. Bd. School Directors, 1111 N. 20 St., Zone 3, John Marshall Junior-Senior High School, $4,630,000. Plans deposit $150. Brust & Brust, 135 W. Wells St., Zone 3, and Eschweiler & Eschweiler, 725 E. Mason St., Zone 2, archts. CD 1-30.

BUILDINGS—LB & CA

▲ **Marvin Helf**, 1001 Euclid Ave., Cleveland 6, O., Owner Builds, $4,000,000, 10 story, APARTMENT, 11802 Edgewater Dr., LAKEWOOD, O. Weinberg & Teare, Citizens Bldg., Cleveland 14, O., archts. CD 11-18-55, under Golden Age Cooperative, Inc., as owner.

▲ **Indiana Constr. Inc.**, 6132 Oakton St., Morton Grove, Ill., CA $4,000,000, 100 unit MOTEL, bowling alleys, parking area, southwest corner Lawrence and Harlem Ave., HARWOOD HEIGHTS, Ill., Holiday Bowl Corp., 100 W. Monroe St., Chicago, Ill. CD 12-29.

▲ **Pacesetter Homes, Inc.**, 16162 Drexel Ave., South Holland, Ill., Owner Builds, $8,000,000, 410 two story, brick, stone TOWNHOUSES, 138th and Halsted.

(Continued on page 78)

ONLY RAMSET

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Ramset, and only Ramset, offers a complete line of "job-fitted" fasteners . . . guarantees the most economical fastener for every application. Versatile Ramset is the best-known and most widely-used powder-actuated fastening system in the entire construction field.

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In only 3 cylinder sizes

NON-TURBOCHARGED RATINGS

NEW
"2-53"
20 to 47 H.P.

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"3-71"
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NEW
"4-53"
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"4-71"
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NEW
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76 to 195 H.P.

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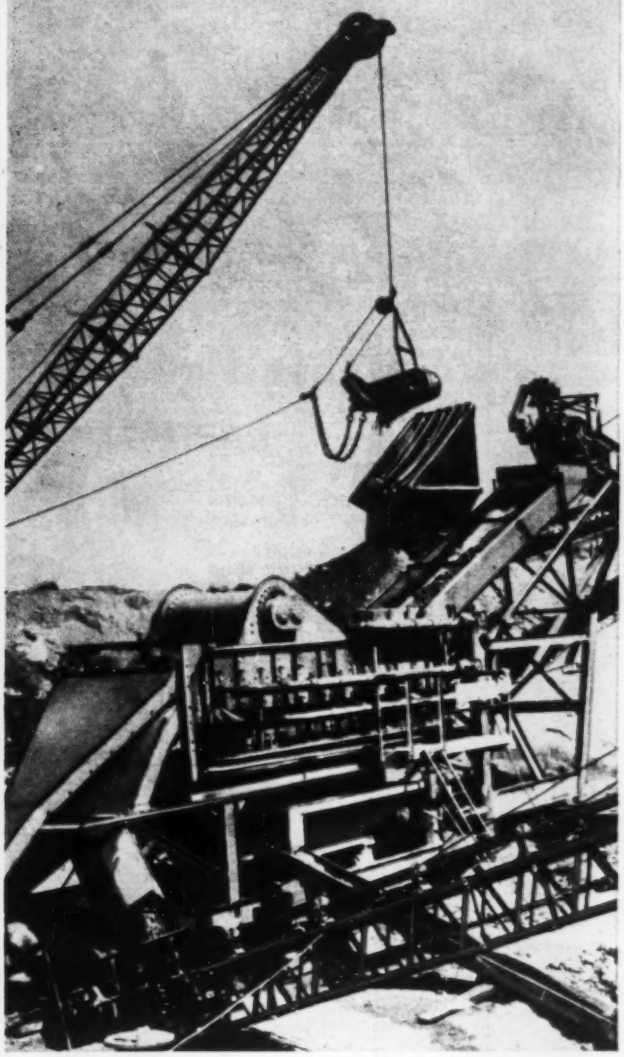
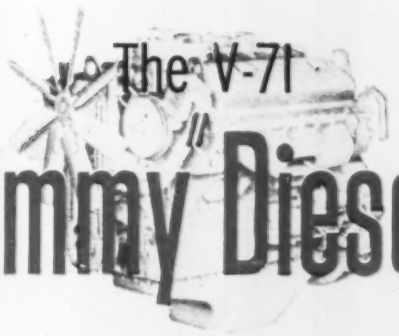
H.P. IN ONLY 3 CYLINDER SIZES





The V-71 "Jimmy" Diesels

NEW FOR THE CONSTRUCTION INDUSTRY

6-, 8-, 12-, and 16-cylinder "V" versions of the famous GM Series 71 Diesel

The new V-71 "Jimmy" Diesels are a further illustration of GM Diesel's mighty new power concept—rounding out the All-Purpose Power Line—yet retaining the GM Diesel family relationship and parts interchangeability.

Here are engines that combine every profit-making, cost-saving advantage any Diesel has ever had. Diesels that boast an ingeniously engineered combination of new compactness, lightweight, high efficiency, durability and inexpensive maintenance.

These V-71 "Jimmy" Diesels are available in 6-, 8-, 12-, and 16-cylinder models rated from 112 to 675 h.p. plus 24- and 32-cylinder "Twins" up to 1650 h.p., when turbocharged. They're itching to get to work wherever there's hard work to be made easy.

To see how these new members of the All-Purpose Power Line meet your needs, write GM Diesel, Dept. C-3, Detroit 28, Michigan.

GM DIESEL

DETROIT DIESEL ENGINE DIVISION,
GENERAL MOTORS, DETROIT 28, MICH.

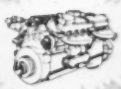
In Canada: GENERAL MOTORS DIESEL LIMITED, London, Ontario
Parts and Service Worldwide

NEW
"6V-71"
112 to 252 H.P.

NEW
"8V-71"
150 to 334 H.P.

"6-110"
160 to 335 H.P.

NEW
"12V-71"
224 to 504 H.P.

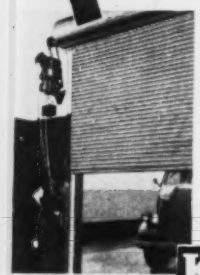


NEW
"16V-71"
300 to 675 H.P.

NEW
"24V-71" (Twin 12)
448 to 1008 H.P.

NEW
"32V-71" (Twin 16)
600 to 1350 H.P.
(Turbocharged—1650 H.P.)

Kinnear Rolling Doors



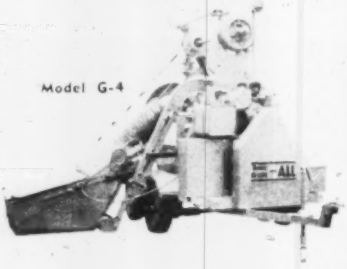
Kinnear *originated* the upward-acting door with the curtain of interlocking steel slats. For more than half a century, Kinnear has built doors *exclusively*—your assurance of highest quality. Write for Kinnear catalog!

KINNEAR ROLLING DOORS *Saving Ways in Doorways*

The KINNEAR Manufacturing Co.
1820-40 Fields Ave., Columbus 16, Ohio
1742 Yosemite Ave., San Francisco 24, Calif.

TRUE GUN-ALL SHOOTS **REAL** CONCRETE

Applies up to seven cubic yards of quality controlled concrete per hour



1. Shoots ¾" graded rock aggregate, wet sand without drying.
2. Ideal for construction of thin shell concrete structures.
3. Weighed aggregates — water-cement ratio controlled.
4. Built-in mixer paddles.
5. No dusting or fogging.

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It's Faster and Cheaper
MORETRENCH WELLPOINT SYSTEM
Guarantees Results on Wet Jobs
MORETRENCH CORPORATION
World's Oldest, Largest and Most Experienced Predrainage Organization
Send for Catalog
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Chicago, Ill. Tampa, Fla. Houston, Tex.
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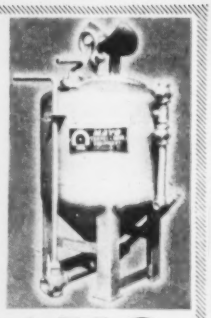
PNEUMATIC GROUTER and "Pea Shooter"
Efficient and easy to operate. Places low pressure grout . . . also injects sodium silicate emulsions to stabilize ground. Readily converts to Pea Shooter. See Catalog No. 13.



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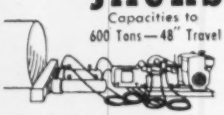
TUNNEL AND MINE EQUIPMENT
Lancaster, Penna.

ELGOOD
Hydraulic & Mechanical
JACKS
Capacities to 600 Tons—48" Travel



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Large Stock Immediate Delivery
Write for Job Fact Sheets

ELGOOD EQUIPMENT CORP.
373 Ten Eyck St., Brooklyn, N.Y.
HY 7-5445

(Continued from page 75)

Sts., RIVERDALE (STA. CHICAGO), ILL. Harry J. Quinn, 16162 Drexel Ave., South Holland, Ill., archt.

▲ Arthur G. McKee & Co., 2300 Chester, Cleveland, O., CA Est. $5,000,000, design and construct 2,000 ton per day IRON ORE PELLETIZING PLANT, HUMBOLDT, MICH. Humboldt Mining Co., Champion, Mich.

WEST OF MISSISSIPPI

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

March 10 Iowa
March 13 South Dakota
March 20 Kansas
March 20, 21 Texas

STREETS AND ROADS

March 10 Colorado, Iowa
March 13 South Dakota
March 20 Kansas
March 20, 21 Texas

BUILDINGS—BA

▲† Mo., Fort Leonard Wood—HOUSING—BA On Or About 4/2—U. S. Eng., 1800 Federal Office Bldg., Kansas City Zone 6, 700 Capehart Housing units, utilities, streets, parking, ENG-23-028-59-44. $10,000,000-$11,000,000. CD 9/8.

BUILDINGS—SLC

▲ Colo., Westminster—SHOPPING CENTER—Dunton Realty Co., Westminster Plaza Co., Midland Savings Bldg., Denver, soon lets contract 250,000 sq. ft. shopping center, parking facilities for 3,000 automobiles, $4,500,000. Jared B. Morse, 104 Sherman Plaza, Denver, archt. CD 2/1/57.

HEAVY CONSTRUCTION—LB & CA

▲† Morrison-Knudsen Co., Inc., 319 Brodaway Ave., Boise, Idaho, Henry J. Kaiser Co., 1924 Broadway, Oakland, Calif., and Johnson, Drake & Piper, Inc., Baker Bldg., Minneapolis, Minn., CA $17,613,384, Greer's Ferry Dam and appurtenant works on Little Red River, near Heber Springs, CIVENG-03-050-59-22, ARKANSAS. U. S. Eng., 300 Broadway, Little Rock, Ark. CD 2/12, under LB.

▲ TEXAS—State Hy. Comn., Austin.
Elmer C. Gardner, Inc., 10050 Old Katy Rd., Houston, Tex., CA $4,163,717, 2.252 mi. causeway, Lavaca Bay, Hy. St. 35, Proj. F 1059 (7), Calhoun Co. Bids Feb. 14, awarded Feb. 18. CD 2/19, under LB.

BUILDINGS—LB & CA

▲ Huber, Hunt & Nichols, Inc., 2450 Stibbs Ave., Indiananapolis, Ind., CA Est. $12,000,000, MANUFACTURING PLANT, Reno and West Aves., OKLAHOMA CITY, OKLA. Western Electric Co., 195 Broadway, New York, N. Y. Charles T. Main, Inc., 80 Federal St., Boston, Mass., and Benham Engineering Co., 215 E. 23 St., Oklahoma City, Okla., consult. engrs. Awarded Feb. 12. CD 3/12/57.

FAR WEST

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

March 25 California

STREETS AND ROADS

March 18, 25, 26 California

▲† Calif., Lompoc—TRAINING BASE FACILITY, etc.—BA 4/2—U. S. Eng., 751 S. Figueroa St., Los Angeles, training base facility, WS 107A-2, incl. missile silos, terminals, control center pads, test mast bases, 10 tunnels, blast locks, loading, signal alarm and fire sys. and utilities, Vandenberg Air Force Base, ENG-04-353-59-65. $7,000,000. Extended date. CD 2/10.

HEAVY CONSTRUCTION—LB & CA

▲ Valley Constr. Co., Rainier Ave., Seattle, Wash., and Morrison-Knudsen Co., Inc., 319 Broadway, Boise, Idaho, LB $6,984,693, est. $8,461,282 (13 bidders), 24.12 mi., 54- to 66-in. modified prestressed concrete cylinder pipe line from Tolt River reservoir to city, SEATTLE, WASH. City County-City Bldg., Seattle, Wash. Bids Feb. 18. CD 1/21.

CANADA

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

March 25 Ontario

STREETS AND ROADS

March 10 Saskatchewan
March 17 British Columbia
March 25 Ontario

LATIN AMERICA

BUILDINGS—BA

▲ Argentina, Buenos Aires—HOTEL—BA 5/4—P. Wks. Minister, Govt. of Argentina, 9 de Julio 1925, hotel, incl. swimming pool, helicopter landing on roof, air conditioning, Palermo Park and Av. Libertador General San Martin, $3,000,000.

U. S. POSSESSIONS

HEAVY CONSTRUCTION—LB & CA

▲† Merritt-Chapman & Scott Corp., 261 Madison Ave., New York, N. Y., U. S. A., CA $7,363,675, widening, deepening Panama Canal at Gaillard Cut and adjacent reaches, Panama Canal, CANAL ZONE, Panama Canal Co., Balboa Heights, Canal Zone. Bids Feb. 2. CD 2/4, under LB.

(Proposal Advertisements see pp. 91 to 94)

LOS ANGELES INTERNATIONAL AIRPORT,
COMPLEX I, EAST-WEST RUNWAYS
Los Angeles, California

Owner:	City of Los Angeles
Architect:	Parsons and Luckman, Paul R. Williams, Welton Beckett & Assoc.
Engineer:	Donald B. Warren Co. and S. B. Barnes
Contractor:	Griffith Company
Laboratory:	Bureau of Standards, City of Los Angeles
Manufacturer:	Griffith Company
Structure:	Paving concrete

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1 IMPROVE CONCRETE QUALITY: —

MARACON® promotes more complete hydration of cement particles and permits a substantial reduction in the unit water content without loss of plasticity or consistency of the mix. Low water content means greater durability and resistance to weathering.

A. Minimize shrinkage in concrete before and after hardening, due to lower water content and more complete hydration of cement.
B. Decrease permeability.
C. Achieve greater density and higher durability factors.

2 LOWER CONCRETE COSTS: —

A. Maintain slump and workability at low W/C ratios.*
B. Attain higher strengths without increasing cement content of a mix.**
C. Permit economical redesign of conventional concrete mixes.

*Decrease water by as much as 20% . . .
**Increase strengths by as much as 40% . . . depending on the mix design.
(The above figures are not represented as maximum. Greater percentages have been achieved in both respects.)

DISTRIBUTORS

West of the Rockies, Hawaii and Alaska
Admixtures, Inc.
965 N. Fair Oaks Ave.
Pasadena, California

East of the Rockies
Truscon Laboratories
Division of
Devoe & Raynolds Co., Inc.
1700 Caniff, Detroit 11, Mich.

(Mississippi only)
Ready-Mix Concrete Company
Meridian, Mississippi

Use the coupon for more information.

MARATHON • A Division of American Can Co.
CHEMICAL SALES DEPT. • MENASHA, WIS.

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NAME .....

COMPANY .....

ADDRESS .....

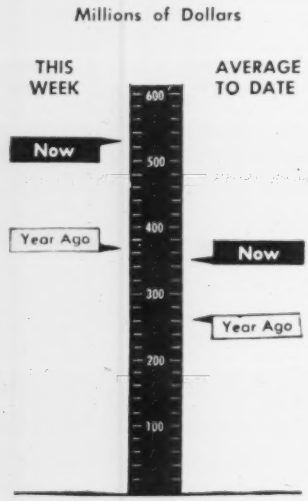
E 39

MARACON also reduces water requirements in concrete mixes containing pozzolanic materials.

MARATHON
A Division of American Can Company
CHEMICAL SALES DEPARTMENT
MENASHA, WISCONSIN

Construction Scoreboard

CONTRACTS ...



AMOUNT OF CONTRACTS LET

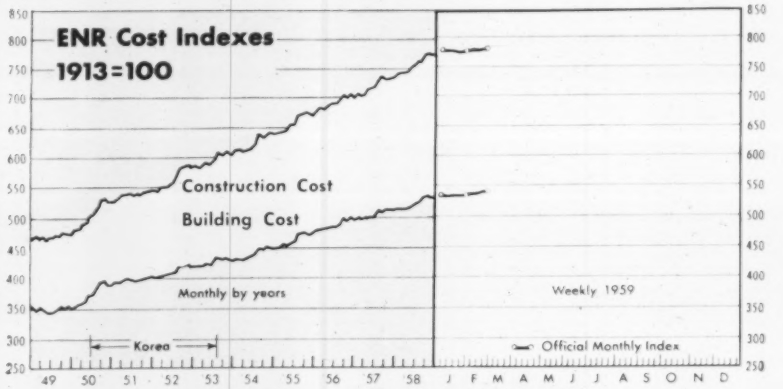
By Ownership	This Week	Cum. 10 wks 1959	Chge '58-'59 %
	millions		
All Heavy Constr.	$523.1	$3,478.7	+24
Private	230.0	1,665.7	+28
Public	293.1	1,813.0	+21
State & Municipal	181.6	1,263.9	+ 6
Federal	115.5	549.1	+84
By Type of Work			
Public			
Waterworks	17.1	94.6	+143
Sewerage	9.6	107.4	+ 5
Bridges*	34.2	136.6	+73
Highways	77.1	496.4	+19
Earthwork, Waterways	49.6	135.7	— 3
Buildings, Excl. Housing	37.1	444.3	+ 9
Housing	41.6	122.0	—45
Unclassified	26.7	274.9	+209
Private			
Buildings			
Mass Housing	93.2	676.6	+57
Commercial	40.4	424.3	+30
Industrial	89.1	473.1	+ 7
Unclassified	7.4	91.8	—14

*Includes private bridges

NOTE: Minimum size projects included are: Waterworks and waterways, $53,000; other public works, $88,000; industrial buildings, $110,000; other buildings, $400,000.

. . . CAPITAL

New Capital For Construction	Week of Feb. 26	Cum. 9 wks 1959	Chge '58-'59 %
	millions		
Corporate Securities	$ 61.0	$572.9	—41
State and Municipal:			
All Except Housing	276.0	1,079.0	—15
Housing	....	1.3	+30
Federal Loans	2.0	17.0	—58
Federal Aid	....	....	....
Total Nonfederal	$339.1	$1,670.1	—27
Federal Appropriations:			
Projects in U. S.	....	....	—100
Outside U. S.	....	....	....
Total New Capital	$339.1	$1,670.1	—40


ENR Cost Indexes
1913=100
Construction Cost
Building Cost
Monthly by years
Weekly 1959
Korea
Official Monthly Index
49 50 51 52 53 54 55 56 57 58 J F M A M J J A S O N D

CURRENT COST INDEXES

ENR INDEXES (1913=100), 20-cities' average	Week of Feb. 26 1959	% Change from Jan. 25 1959	% Change from Feb. 27 1958
Construction Cost	781.35*	+0.3	+5.0
Building Cost	540.32*	+0.6	+4.7

* Official Monthly Index for March 1959.

To convert above indexes to 1926 = 100: Divide Construction Cost by 2.080; Building Cost by 4.850.
1949 = 100: Divide Construction Cost by 4.770; Building Cost by 3.518.

WAGE RATES, 20-cities' average

	Mar. 1959	% Change from Feb. 1959	% Change from Mar. 1958
Common	2.503	0	+4.7
Skilled (average 3 trades)	3.796	+0.1	+4.5
Bricklayers	4.047	0	+4.1
Structural Ironworkers	3.817	+0.3	+4.6
Carpenters	3.523	0	+4.6
Equipment operators (average three types)	3.418	0	+3.4

MATERIAL PRICES, 20-cities' average, f.o.b.

Structural Steel (average 3 mills), per cwt	5.50	0	+4.1
Lumber, 2x4 Fir, per M fbm	118.39	+2.7	+6.0
Lumber, 2x4 Pine, per M fbm	105.55	+2.4	+5.8
Cement, bulk, per bbl	3.99	+0.2	+0.5
Sand, per ton	2.481	0	—0.6
Ready-mixed concrete, per cu yd	14.005	+0.4	+1.2
Gypsum sheathing, 1/2"x2'x8', per Msf*	62.598	0	—0.5
Fiber board sheathing, 3/8" sq. ed., per Msf*	70.958	—0.6	+0.2
Mineral wool insulation, 3" batts, per Msf*	69.788	0	—1.7
Crushed stone, 1 1/2", per ton, CL	2.754	—0.1	—3.0
Concrete blocks, sand/gravel, 8"x8"x16", each*	.225	+0.4	—1.7

	Feb. 1959	Jan. 1959	Feb. 1958
Brick, common per M	37.846	+0.9	—0.8
Lime, hydrated finishing, per ton, CL	37.964	+0.5	+3.0
Structural clay tile, 3x12x12", per M, 2,000 up*	182.556	+0.8	—0.1
Vitrified clay sewer pipe, std 12", per ft	1.350	+0.7	+3.5
Concrete sewer pipe, 12", per ft	1.339	+2.0	+7.4

* Delivered, truck lots

ENR INDEX REVIEW

	Construction Cost 1913=100	Construction Cost 1949=100	Building Cost 1913=100	Building Cost 1949=100	Volume 1913=100	Volume 1949=100
1958						
Mar	744.41	156.05	516.09	146.70	520	150
Apr	745.78	156.34	516.61	146.85	585	169
May	751.57	157.56	518.62	147.42	674	195
Jun	757.31	158.76	521.09	148.13	661	191
Jul	762.52	159.85	524.29	149.03	705	204
Aug	764.44	160.25	525.62	149.41	575	166
Sept	773.47	162.15	535.02	152.09	541	156
Oct	775.30	162.53	536.53	152.51	446	129
Nov	774.12	162.28	534.96	152.07	384	111
Dec	773.81	162.22	534.79	152.02	466	135
1958 Average	759.16	159.15	524.68	149.15	531	153
1959						
Jan	778.28	163.15	536.23	152.43	460	133
Feb	778.75	163.25	537.25	152.72	472	136
Mar	781.35	163.80	540.32	153.59	....	....

BIRD'S EYE VIEW OF RESPONSIBILITY

Driving pile foundations is just one aspect of Raymond's *single responsibility*. Of all the foundation organizations in the country only Raymond offers—and is solely responsible for—complete foundation service including soil investigation, pile manufacture, load testing and installation. When you specify Raymond foundations you receive the benefit and economy of having all the details handled expertly and efficiently by one company. On your next project, no matter how large or small it may be, employ Raymond's more than 300,000,000 man-hours of experience in providing all types of foundations. Get all the facts from the Raymond office nearest you, or write our main offices, 140 Cedar Street, New York 6, New York.

RAYMOND
CONCRETE PILE COMPANY

A Division of Raymond International, Inc.

140 CEDAR STREET, NEW YORK 6, N. Y.

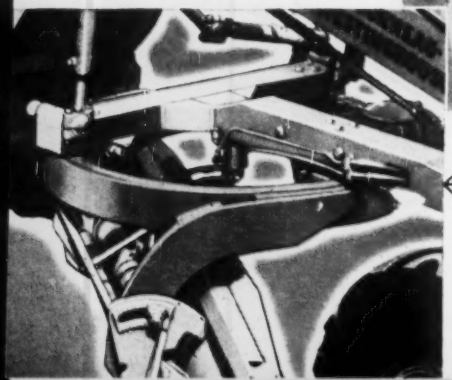
Branch offices in principal cities of the United States. Subsidiaries in Canada, Central and South America and other countries around the world.

FOUNDATIONS FOR THE STRUCTURES OF AMERICA . . . COMPLETE CONSTRUCTION SERVICES ABROAD

New Big Circle!
New Visibility!

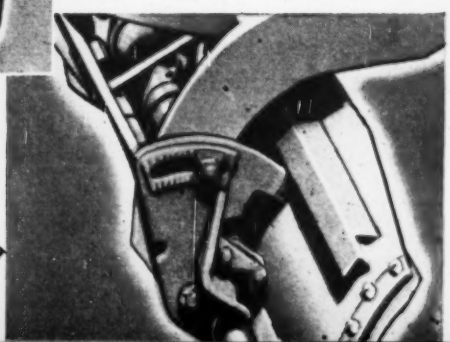
HERE IS VISIBILITY PLUS!

Your operator can see straight ahead as well as both ends of blade where visibility counts!



Big 63" CIRCLE with "straight-down" lift links assures *positive*, accurate blade pressure

Save time in the field with new moldboard tilt adjustment. To make desired adjustment, just loosen one nut on each circle leg.



New Easy Blade Adjustment!

Check these major changes in L-W graders ... together with proven L-W quality features, they're your best bet for profits in 1959

Now, the world's *finest* graders are even *better!* New 1959 LeTourneau-Westinghouse motor graders, now in production, offer you these important *new* features:

FULL-SWEEP VISIBILITY ... sitting or standing, your operator can see *straight ahead* and *both ends of the blade*, where full visibility counts!

NEW BIG CIRCLE ... 63" overall diameter, none bigger in the industry! Wide-spaced circle legs assure stable blade control.

EASY TILT ADJUSTMENT ... your operator makes only one easy adjustment on each circle leg to change tilt of blade. New universal mounting simplifies field installation of slide or power-shift moldboards.

There are *more* changes ... including enclosed ball-socket lift-link caps and *a new 6-cylinder engine* for 3 models ... plus all of the proven *speed* and *power* advantages that have made L-W graders the standard of the industry for years.

See your L-W Distributor *now*. He has full facts on the grader that can make your grading operations more *profitable* this year.

Here's the 190-hp POWER-*Flow*® 660 ... one of seven sizes of L-W graders now available, with from 60 to 190 hp. POWER-*Flow* models offer full torque-converter transmissions; other L-W graders offer transmissions with 8 forward speeds, 4 reverse, and 3 optional creeper speeds ... unmatched by any other grader!

G-2126-DC-2

LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

Will Tax Ruling Hike Materials Prices?

A U. S. Supreme Court decision last week sent financial, legal and accounting executives of building materials firms scrambling to law books, ledgers and earnings and expense records. What they find may ultimately raise construction materials prices.

The court ruling grants states broad power to tax income received by out-of-state corporations on sales made in each state. It affirms a Minnesota law that had been challenged by Northwestern States Portland Cement Co. of Mason City, Iowa.

Justice Tom Clark, speaking for the majority, said, "The entire net income of a corporation, generated by interstate as well as intrastate activities, may be fairly apportioned among the states for tax purposes . . ."

In the Northwestern case, Minnesota used income brought in by a local sales office as a basis for taxing the cement company.

Accountants and executives of manufacturing companies, questioned by ENR, say the decision will have little or no impact immediately. But they agree the decision will sooner or later add to some manufacturers' costs.

Among manufacturers, the greatest impact will be on small firms. Most of the major building materials producers are already paying taxes in other states.

Many states have been collecting such taxes for some time from large manufacturers and suppliers. The decision merely establishes the legality of the tax. But it is this fact that may weigh heavily on small materials producers.

There have been cases where the tax on a small firm would be almost too small for the state to go after—perhaps as little as $100 to $200. Rather than initiate expensive, time-consuming litigation, some states did not press the issue against out-of-state concerns. Now, with the principle established, states that held off on action may move for more aggressive collection.

There are now 35 states imposing corporate income taxes, so the machinery is available to take full advantage of the ruling if they wish.

States levying such a tax are: Alabama, Alaska, Arizona, Arkansas, California, Colorado, Connecticut, Delaware, Georgia, Idaho, Iowa, Kansas, Kentucky, Louisiana, Maryland, Massachusetts, Minnesota, Mississippi, Missouri, Montana, New Jersey, New Mexico, New York, North Carolina, North Dakota, Oklahoma, Oregon, Pennsylvania, Rhode Island, South Carolina, Tennessee, Utah, Vermont, Virginia and Wisconsin.

The 14 states that do not have corporate income taxes may now come up with the same idea, because of the court's decision. Because such a tax would not cover in-state producers, it might meet with less opposition than most taxes do.

A top executive of a major cement-producing company on the East Coast says his company is "certainly concerned about the potential impact on our costs, profits, and eventually, on our prices." He believes "there appear to be many ambiguities in the decision." Should this be so, the ambiguities may have to be clarified in other court contests.

An accountant says the decision's impact will not be felt for six months, a year, or possibly longer. When there are effects, they will come after slow changes resulting from additional legal procedures, statutes or administrative decisions.

Contractors' taxes won't be affected by the decision. They are now liable for all state income and franchise taxes when they qualify to do business as a "foreign" or nonresident company—and include these taxes in cost estimates.

But one thing is certain. Contractors will have to pay the higher prices when they come.

Vermont Bid Plan Not Much Help to Vermonters

An attempt by Vermont to give resident contractors a bigger share of its interstate highway work by breaking big jobs into little ones apparently isn't working out as anticipated. Two of the first three contracts awarded under the new plan went to out-of-state contractors.

The small contract operation was developed at the urging of the Vermont Road Builders Association. It argued that association members were unable to compete with large, out-of-state firms on big projects. Projects exceeding $1 million, or about one mile in length, are generally beyond their ability to handle, Vermont contractors say.

State Highway Commissioner William Poeter therefore agreed to experiment with smaller jobs. He cut the 3.5 mile Berlin-Montpelier-Middlesex segment of Interstate Route 89, originally planned as one job, into four sections for bidding purposes. Considered as a single project, the roadbuilding job had an estimated cost of $5.6 million.

Successful low bidder for the first "small" contract was a Connecticut company—S. V. Rossi Construction Corp. of Torrington. Its bid on the one-half mile paving job, which includes two bridges, was $1,276,826. Next lowest of the 14 bidders was F. A. Tucker, Inc., of Rutland, Vt., and George and Vredenburg of Montpelier, Vt., on a joint bid of $1,321,492.

The second of the four contracts went to another out-of-state firm, E. D. Swett, Inc., of Pembroke, N. H., submitted a low bid of $954,537 on a bridge project. Fifteen bids were submitted.

In the third letting, however, a resident contractor was finally successful. Contract three was won by Burnett & Campbell, Inc., of Burlington. It bid $1,153,897 on 1.1 miles of paving.

The third and fourth contract awards, however, do point up another advantage that the Road Builders Association ascribes to the "small-job" plan. The association contends that smaller-sized jobs give resident contractors more than "one shot" at the work. If they fail to win the first contract, they still have a shot at remaining portions of the work.

The highway department originally insisted that smaller contracts would raise the cost of roads. The Road Builders Association presented a statistical cost analysis, however, that allegedly proved small jobs were more economical than larger ones.

Highway department officials have not publicly disputed the results of the association's study.

Commissioner Poeter did say, however, that the small-job plan currently applies only to the Berlin-Montpelier-Middlesex project. Before becoming committed ourselves to a new procedure permanently, "we want to see what happens on this one section," he explained.

(*B&F continued on page 86*)

Just 6 seconds

saved per push-cycle can give you an increase of $9.60 an hour

Faster push-loading can give you a substantial increase in scraper production and income. Here's how: If your tractor now is push-loading 25 loads per hr. in 2-minute push-cycles, just 6 seconds saved per push (see chart) can mean 1.3 more payloads moved an hour. With scrapers averaging payloads of 18½ yds., this would result in 24 more yds. per hr. — or, at 40¢ dirt, an extra income of $9.60 per hr. per scraper fleet. Figuring a minimum of 1600 hours effective production per year, this minimum gain in yardage would produce for you a plus of $15,360.

Pusher Cycle (includes positioning behind scraper, pushing, boosting scraper out of cut and returning)	Loads per 50-min. hr.	Yards per load	Yards per hour	Increased yardage per hour	Pay per yard	Extra income per hr.
120 sec.	25.0	18½	462.5			
	with 6 seconds saved per push-load					
114	26.3	18½	486.5	24	40¢	$9.60
This additional income per hour will pay all pusher depreciation costs, plus the major portion of interest, insurance and taxes.						

You can realize this extra yardage and income with a fast, powerful pusher that can position quickly behind your scraper. One that can push with speeds matched to your rubber-tired scrapers . . . and with acceleration available to give them a running start out of the cut in high hauling gear.

Only the LeTourneau-Westinghouse 436-hp, rubber-tired "Twin-C*" pusher has these speed and power qualifications for faster push-loading.

20 mph speeds, non-skid wagon steer

For quick positioning behind scraper, this 436-hp pusher, with synchronized tandem engines, has speeds to 20 mph forward, 5.8 in reverse. Also, for fast maneuvering to make contact with scraper, pusher has wagon-type steer — through large ring gear and pinion in yoke connection. For fast pushing, Twin-C torque converter matches loading speeds of any of your rubber-tired scrapers. This matched speed . . . plus power up to 65,000 lbs. of drawbar pull by actual test . . . helps this super pusher get bigger loads faster, gets scraper on its way at maximum hauling speed.

You also get plenty of traction with your four-wheel drive in soft going. Each pair of drive-wheels is controlled by its own exclusive L-W power-transfer differential. When any one wheel starts to spin, wheel on opposite side gets power boost (up to 80% of total).

In addition to these capabilities for faster loading, the Twin-C pusher offers you all the advantages of tandem push-power in *one* unit with *one* operator. There is no need to double-head big, slow crawlers to have adequate power to push larger scrapers. With the Twin-C you have ample power . . . plus 20 mph speed . . . plus the economy and maneuvering ease of one machine with one operator.

Ask for more details

Write or call for full specifications on this rubber-tired super pusher that can save you time and money with faster pushing cycles. *Trademark TW-1746-DC-1

Twin-C's big, electric-controlled push-plate is easily raised or lowered by operator with fingertip control, to make on-center connection with every push-block. Once push starts, plate "floats" . . . automatically keeps contact with scraper until bowl is filled.

LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

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Where quality is a habit

Private Contracts Strong in February

Private enterprise grabbed front position in the construction market last month. Private construction contracts in February jumped 37% over January to $750 million, according to ENR records.

The private contracts figure offset the 26% drop in public contracts, which totaled $564 million in February. Private contracts accounted for more than half of $1.3 billion in total contract volume for February.

Total for January and February is just short of $3 billion. This is a 21% increase over the volume of 1958's first two months.

Large-scale homebuilders are providing most of the upward thrust in the private contracts sector. Mass housing awards totaled $336 million, 69% more than the January rate and almost double the amount one year ago.

For the first two months, housing awards total $583 million. This is 65% above the similar period last year. Mass housing volume therefore represents the single largest classification of the ENR construction market so far this year.

Commercial building is also moving into a starring role. Commercial contracts in February totaled $194 million. This is a 27% increase over January. The two month total is $384 million, a 38% increase over the same period last year.

Industrial building contracts in February totaled $178.2 million. While this is 23% below one year ago, the weekly average volume last month topped every month in 1958, except February. Total contract volume for January and February stands at $383.3 million, 5% below the first two months of 1958.

In the public works category only one classification—waterworks—showed an increase over January. With volume at $43.1 million in February, this classification scored a 263% increase over January. Contract awards for the first two months amount to $77.6 million. This is 122% above the first two months of last year.

All public works contracts in February totaled $564.3 million. This is only a 0.4% increase over January. For the first two months, public contract awards amount to $1.5 billion, a rise of 17% over last year.

And for these two months, every type of public works surpasses the same period of last year, with the exception of mass housing and earthwork-dams-waterways.

ENR Cost Indexes Hit Record

Increasing lumber prices push ENR's 20 Cities Indexes to an all-time high this month.

The Construction Cost Index is at 781.35 based on 1913 = 100. This value represents a 0.8% increase over February, and 4.7% over March '58.

The ENR Building Cost Index moves up to 540.32 for March, 0.3% above February, and 4.5% above March 1958.

The average Douglas fir 2 x 4 price for the 20 cities is up $3.24 per Mfbm this month to $118.39. Southern pine prices are up an average of $2.53 per Mfbm to $105.55. Boston paces the increases with a $10 Mfbm jump. Cincinnati shows a $9 increase for fir and a $7 boost for pine. Prices are higher by as much as $8.25 Mfbm in other cities.

The higher prices reflect increasing demand from the housing market and shortages at Douglas fir mills in the Northwest.

Cement prices, stable this month, are expected to decline in some northeastern cities when rail freight rates are cut April 1. Reason for the cuts: Railroads want to recoup freight lost to the truckers.

There are few wage changes this month: Atlanta ironworkers up 10 cents an hour; Boston building laborers' rate goes up 5 cents; and heavy construction laborers receive a 10 cents hourly raise. Cincinnati ironworkers' wages are up 5 cents an hour.

Engineering Construction Contracts for February

Four Weeks—Thousands of Dollars (000 Omitted)

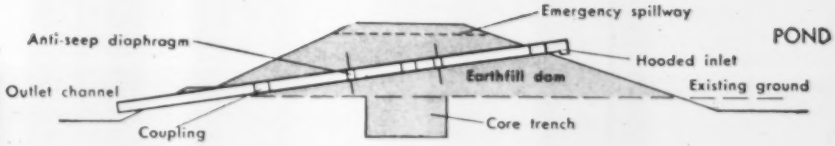
	February, 1959								Two Months			
	New England	Middle Atlantic	South	Mid West	West of Mississippi	Far West	Total U. S.	% Change February '58 to '59	U. S. Cumulative 1959	U. S. Cumulative 1958	% Change '58 to '59	Canada February 1959
Public Works, Total	**47,997**	**79,207**	**126,871**	**62,803**	**152,596**	**94,845**	**564,319**	**+0.4**	**1,519,891**	**1,299,323**	**+17**	**31,982**
Waterworks	18,159	1,993	5,602	4,852	3,605	8,914	43,125	+263	77,574	34,913	+122	1,992
Sewerage	1,285	12,866	6,526	9,555	5,210	4,730	40,172	+23	97,637	92,081	+ 6	9,751
Bridges	1,681	4,144	5,313	10,811	7,598	267	29,814	−27	102,429	68,173	+50	2,980
Earthwork, waterways	567	957	8,107	891	15,883	3,818	30,223	+156	86,048	131,788	−35	..
Streets and roads	14,788	23,978	41,226	15,455	66,774	22,139	184,360	+11	419,157	364,071	+15	6,685
Buildings: Residential	973	520	4,238	6,836	16,662	2,449	31,678	−71	80,509	196,973	−59	..
Other	7,161	18,585	42,868	10,059	22,448	31,058	132,179	−19	408,225	340,038	+20	6,410
Unclassified	3,383	16,164	12,991	4,344	14,416	21,470	72,768	+182	248,312	71,286	+249	4,164
State & Municipal	45,007	61,833	84,860	51,094	115,818	68,702	427,312	+ 1	1,082,269	1,035,738	+ 4	26,610
Federal	2,992	17,374	42,011	11,709	36,778	26,143	137,007	..	437,622	263,585	+66	5,372
Private, Total	**45,023**	**325,502**	**131,856**	**79,898**	**98,422**	**69,449**	**750,150**	**+22**	**1,435,679**	**1,134,281**	**+27**	**56,562**
Bridges	..	..	..	..	..	..	..	..	..	..	..	..
Buildings: Industrial	8,445	26,400	91,672	2,670	23,471	5,563	178,221	−23	383,921	402,936	− 5	24,019
Mass housing	20,981	199,233	7,740	31,952	39,211	36,646	335,763	+96	583,427	353,053	+65	18,568
Commercial	15,432	99,429	11,727	19,950	21,325	25,740	193,603	+30	383,941	277,101	+38	13,975
Unclassified	165	440	20,717	5,326	14,415	1,500	42,563	−32	84,390	101,191	−17	..
Total Feb., 1959—4 weeks	**93,020**	**404,709**	**258,727**	**142,701**	**251,018**	**164,294**	**1,314,469***	**+12**	..	..	..	**88,544**
Jan., 1959—5 weeks	88,956	380,567	282,161	250,225	313,694	245,498	1,561,101	..	..	..	..	140,750
Feb., 1958—4 weeks	72,848	278,961	121,270	290,798	222,416	188,498	1,174,791	..	..	..	..	71,008
Two Months—1959	**181,976**	**785,276**	**540,888**	**392,926**	**644,712**	**409,792**	..	..	**2,955,570***	..	**+21**	**229,294**
Two Months—1958	141,107	651,521	346,176	503,590	468,209	323,001	..	..	..	2,433,604	..	181,080
% Change '58 to '59	+29	+21	+56	−22	+38	+27	..	..	..	..	..	+27

* Add Alaska: 2/59 $3,974 2 Mos. '59 $6,829

ENGINEERING NEWS-RECORD *reports continental U. S. construction projects of the following minimum costs—Waterworks, excavation, drainage and irrigations,* $53,000; *other public works,* $88,000; *industrial buildings,* $110,000; *other buildings,* $400,000.

Williams and Bessert demonstrate

How to build a farm dam and pond



1 On this watershed project, Soil Conservation Service engineers designed and furnished detailed plans . . . then staked it out, and cooperated during the work. The project called for a 60'-thick Class "B" earth dam; grading of pond bottom, with an island at the northerly end; and an outlet channel. It also included a diversion ditch, relocating the outflow of run-off to another area.

Construction of a typical farm dam and pond was a feature attraction at the 1957 Illinois State Plowing Matches, held at Niel C. Hurley's "Colleens' Cote Farm," near Huntley, Ill. Williams and Bessert, land improvement contractor from Trivoli, Ill., handled the earthmoving. Cooperating were: Soil Conservation Service, U.S. Department of Agriculture; McHenry County Conservation District; LeTourneau-Westinghouse Co.; Thor Power Tool Co.; and WGN radio and television.

Don't overlook this $15,000,000,000 opportunity!

The Federal Small Watershed Program is a $15 billion opportunity for contractors. Money is available — RIGHT NOW — for building farm ponds, terraces, waterways . . . for channel work and desilting basins. Don't overlook this profitable source of work. Check with your nearest U.S. Soil Conservation Service office, or with state and local conservation and farm groups.

2 Williams and Bessert "roaded" a 9-yd D Tournapull†, an older D 'Pull*, and also hauled in 2 crawlers and a wobble-wheel compactor to "Colleens' Cote Farm." Contractor planned the 5,000-yd dirtmoving job for 90% completion in 3 days . . . with finish on day of plowing matches. *Heaviest rain in 20 years* postponed the contest, delayed dirt work, made pumping and drainage work necessary.

3 D 'Pulls stripped topsoil from the dam area, and from part of the pond bottom. Then Tournapulls cut the core trench, at the base of the dam . . . removed unsuitable material, down to solid clay. Excavated material was hauled to fill gullies around the pond, and to build-up the island area. Here hauls averaged 1400', with each Tournapull delivering a load of dirt to the fill every 5.5 minutes.

4 Good (impervious) clay from pond bottom was spread in core trench, and then dam proper was raised. This dirtmoving was short-haul . . . just over 200' . . . a very well-balanced operation. The 2 Tournapulls moved 7-yd payloads . . . each hauled one load every 2.7 minutes. Williams and Bessert used a crawler-drawn wobble-wheel compactor to achieve the 95% compaction specified.

5 The new earthfill dam was built-up to overflow-pipe height, with top-of-dam grade sloped toward downstream, for installation of prefabricated 18" corrugated pipe with 2 anti-seep diaphragms. An air wrench was used to fasten pipe couplings and install diaphragms. Joints were sealed with tape and plastic cement. Meanwhile, 'Pulls continued moving dirt from pond bottom to island area.

6 Then, back at the dam, Tournapulls hauled clay and spread it parallel to overflow pipe. A dozer carefully cast this dirt over the pipe. The two diaphragm pits were refilled by hand shovel. Compaction was very important here, to avoid future seepage around the pipe. So contractor used air-impact tampers to compact the dirt solidly around the diaphragms, and along entire length of the overflow pipe.

7 When pipe was sufficiently covered, Tournapulls resumed their original fill pattern — across the pipe — and raised the earthbank to specified height. An emergency overflow spillway was cut at one end of the dike. Tournapulls then hauled the last of the topsoil to dress the finished dam . . . cleaned-up around the island, diversion ditch, and pond bottom.

†Trademark DP-1840-DCJ-1

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Tuffy® Wire Rope Tips

Guard Against These Killers!

... Get The Full Measure of Service-Life Built In By Wire Rope Specialists

Mangled in a Wedge Socket

Here's a result of improper socketing. It was caused by using a poorly designed or worn-out wedge socket. Failure at the dead end can damage other sections of the rope, too.

Rusty Road to Ruin

Rust—No. 1 enemy of steel—takes a heavy toll in wire rope life. An insidious, silent type of killer, rust often does irreparable damage before it's even noticed. The one-strand break shown here resulted when the rope was allowed to become rust-bound through lack of lubrication. Tests show that, with other conditions ideal, properly lubricated rope has up to 10 times the life expectancy of dry rope.

Tuffy Balanced Scraper Rope

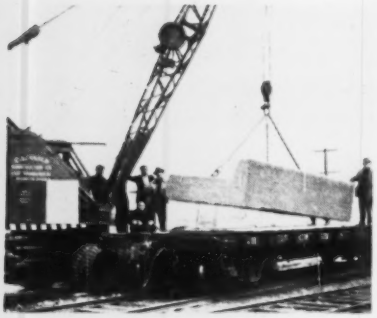
"Balanced" construction makes it flexible enough to withstand sharp bends, yet stiff enough to resist looping and kinking when slack. Also gives higher resistance to the shock of load impact on slack line. Moves more yardage per foot because it's specially built to take the beating of drum-crushing abuse.

Overloaded — Soon Exploded

The rated capacity of a wire rope is based on the breaking strength (catalog) divided by a safety factor applicable to the type of service or use. The grade of steel, type of construction and size of the rope determine tensile strength. It must be properly related to the loads it will carry, or costly and dangerous early failures are likely to occur.

Victim of the Bends

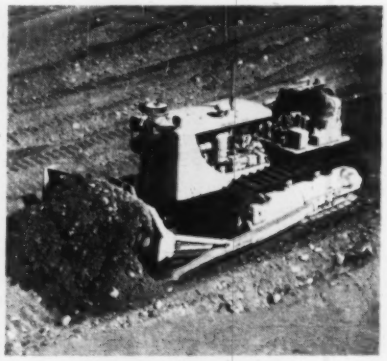
Excessive bending of wire rope accelerates wear. Generally, more flexible ropes are used as bending stresses increase (with decrease in tread diameter of sheave or drum). If a rope is operated on a sheave too small for its bending characteristics, early failure is certain. Through an exhaustive series of bending tests, Union Wire Rope engineers have compiled data that you can use to assure getting the rope construction that will give you the longest service life. Ask about it.



Tuffy Balanced Slings & Hoist Lines

"Balanced" because they combine strength, flexibility and toughness in the proper relationship to do a better job longer.

Tuffy Slings and Hoist Lines are a top-performing team in every type of materials handling. The slings are made of a patented, machine-braided fabric that's next to impossible to knot or kink. The hoist lines are a special construction in which strength, flexibility and toughness are balanced.



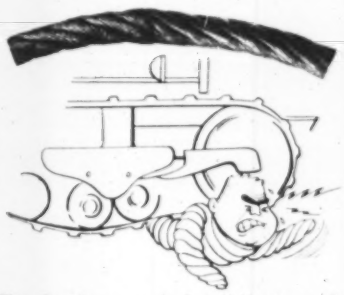
Tuffy Balanced Dozer Rope

Built to give you longer service with less downtime. Mounted on your dozer, a 150' reel of 1/2" or 9/16" can give you a big bonus of extra service. Here's how: when rope shows drum wear or is crushed on the drum, you feed through just enough to replace the damaged part. You save the 40 to 50 feet ordinarily thrown away. Also available in 300' and 500' reels.

Tuffy Balanced Dragline Rope

Here's highest abrasive resistance with super flexibility. Better spooling. Smoother riding on grooves. And Tuffy Dragline Rope hugs the drum when casting for full load. Gives you longer service life, consistent dependability, in handling any material — wet or dry dirt, sand, gravel, rock, cement or minerals.

Crushed by a Tractor Cleat

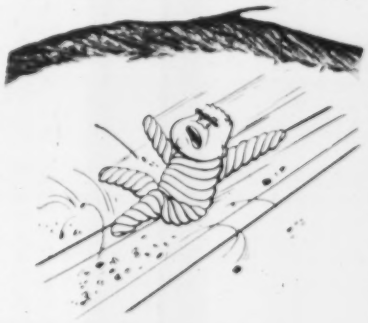


The Sunday punch for this piece of wire rope was delivered by a tractor cleat—just one of many crushing injuries caused by rope being run over or banged into by hard, sharp objects. Even the toughest wire rope is no match for this kind of mistreatment.

After a Suicide Jump

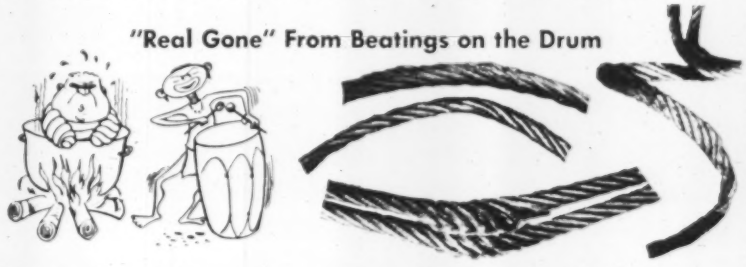
This rope jumped out of sheave and was soon destroyed by pulling around the shaft. Actually it was a case of sudden slack which threw the rope out of the sheave.

Burned on a Frozen Sheave



End of the line came quickly for this rope as the result of operating over a sheave that did not turn. Note the exceptionally heavy abrasion on one side of the rope. Sheaves should be checked thoroughly and often.

"Real Gone" From Beatings on the Drum



Even under normal operating conditions, drum wear gives wire rope severe punishment. This wear concentrates at the cross-over points and at the flange. Excessive drum crushing results from operating on small drums, excessive loading and poor winding. Smooth drums are not recommended. Here are typical "drum beatings": Cross-over wear; cross-over crushing on drum; drum crushing from poor winding; drum-crushing from small drum.

Although drum wear cannot be eliminated, its effects can be greatly reduced. Under properly engineered procedures, two and three times the service can be obtained from the same line by improving drum conditions. Union Wire Rope Engineers will help you with this problem. Get in touch with us for information.

On the "Blink" from a Kink

This open kink resulted from mishandling of rope. Guard against kinks by proper winding on the drum. Never pull a loop smaller. Always enlarge it, then straighten out the rope.

Strangled by a Misfit Sheave

When the bearing surface of a sheave is too small for the rope diameter, pinching action quickly destroys the rope—especially when it's overloaded. The victim shown here was knocked out in just 1½ hours of service.

Tuffy Wire Ropes are "Job Prescribed"—Each Designed for a Particular Type of Machine

There are thousands of wire rope constructions and Union Wire Rope specialists make them all. But, there is only one Tuffy line of wire ropes. Each Tuffy was developed and proved the one best rope for the particular work for which it is intended. It is designed as a functional part of the type of machine on which it is used.

Tuffy Wire Ropes are "job prescribed" and balanced in each prescription are all the ingredients of strength, flexibility and toughness to give you genuine relief from inefficient operation, foreshortened service life and safety hazards. You get longer service life and you cut down on your rope costs. Union Wire Rope Corporation, 2228 Manchester Avenue, Kansas City 26, Missouri.

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AFL-CIO Clings to Labor Unity

Old AFL and CIO differences flare up at San Juan, but the steady hand of President Meany checks feuds

Two facts of importance to construction employers emerge from last week's AFL-CIO mid-winter meeting in San Juan.

• On the legislative and bargaining front, employers will continue to deal with the building trades unions as part of the AFL-CIO, not as a splinter group.

• The jurisdictional conflict between craft and industrial unions, which affects contractor interests as well as unions, will be settled within the framework of the merged labor movement.

For nearly two weeks, the AFL-CIO's top command wrestled with issues that could have blown the lid off the federation. They almost did. But the meeting ended with the labor leaders in solid ranks, despite their personality and union differences. And they left San Juan convinced that if the federation could take the shocks it took and still survive, the old-line split between craft and industrial unions is not going to repeat itself.

• The old cleavage—At no time since the merger had differences of opinion between the old AFL and CIO groups been so sharp.

At one point former CIO President Walter Reuther threatened to resign as chairman of the federation's important Economic Policy Committee in a scrap with AFL-CIO President George Meany, a member of the plumbers union and former head of the AFL.

In another instance, union presidents of the old CIO—Mr. Reuther, James Carey and Joseph Curran—urged that Maurice Hutcheson, general president of the carpenters union, be kicked off the Executive Council.

Had either happened, fragmentation of the federation could well have begun. That it did not was due largely to the efforts of Mr. Meany.

Although the problems have not been settled, the spadework for future peace has been done. Here are some examples:

• Except for a vote to abstain by the United Electrical Workers' Mr. Carey, the council approved a Meany motion to "accept and table" a letter from Mr. Hutcheson explaining details of corruption charges against him. The letter denied that carpenter "union funds" were involved. Mr. Hutcheson stays on the council.

• The officials handled eight top-rated jurisdictional conflicts between the building trades and industrial unions over factory construction work. They settled some and carried over others.

• The council compromised on plans for an AFL-CIO unemployment demonstration as between Mr. Reuther's proposed "march on Washington" and Mr. Meany's counter suggestion for a union conference on the jobless. A mass rally of union delegates and unemployed in Washington, D. C., this spring was decided on.

• Some side-stepping—In part, the union officials were side-stepping matters that showed no hope for immediate solution. Take the Hutcheson case as an example.

The carpenters' president had not appeared at the last five quarterly meetings of the top-level body. He had specifically refused to appear at the past two meetings to answer questions about his indictment on land fraud charges in Indiana and the $330,000 his union spent for publication of a biography of his father.

Instead, Mr. Hutcheson wrote a letter to the council asserting that "not a penny" of carpenters' funds had been used in the land transaction. He defended the book matter, arguing that "no personal gain or profit" had been realized on the publication by a carpenter officer.

The council did not accept this defense, but the members noted in closed session that Mr. Hutcheson had not been convicted in Indiana and that, since no evidence of union funds is involved, no decision had to be made immediately. This was the Meany position that won out.

The plan now is to wait out the issue, to see what happens in Indiana. The next AFL-CIO move will come in September at its biannual convention in San Francisco, where all council members must stand for re-election.

Since Mr. Hutcheson has been authorized by his union to bolt the AFL-CIO, the council would prefer—if there's a suspension to be made—that the entire federation do it in convention.

George Meany: Dogged peacemaker

While the plan was to wait and see what happens, Mr. Meany was asked by his fellow council members to move into the carpenter situation privately. What Mr. Meany can achieve here may well settle the matter.

Three of the principals in the Hutcheson matter were also involved in a fierce verbal barrage in the council over unemployment.

It came up over Mr. Reuther's suggestion for an unemployment demonstration. Mr. Reuther, with Mr. Carey at his side, stood in a toe-to-toe shouting match with Mr. Meany. One council member, who was on the old AFL council at the time carpenters President William A. Hutcheson conducted some of his famous tirades, said: "I have never seen anything like this."

• A peace of sorts—This helped to clear the air, but the participants were still steaming through the week, with Mr. Reuther particularly complaining of Mr. Meany's close control of all AFL-CIO committees, including Mr. Reuther's Economic Committee which had proposed the unemployed march. He finally said he'd resign the committee post. Only a five-hour peace-treaty huddle by the participants and the other council members prevented his resignation.

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Pre-Hire Fought

NSPE is against this part of Kennedy-Ervin bill

The pre-hire labor contract proposal in the Kennedy-Ervin labor reform bill has been severely criticized by the National Society of Professional Engineers, which is now seeking a broad exclusion from this aspect of the labor reform bills. (For more NSPE news, see p. 22).

NSPE President Clark A. Dunn, speaking at the society's mid-winter meeting in Birmingham, Ala., said the pre-hire proposal "could operate to force professional engineers employed by construction contractors to be represented by or join a heterogeneous labor union without being granted a separate election to determine their wishes."

NSPE, which is opposed to the inclusion of any Taft-Hartley amendments in a labor reform bill, takes the position that the certification-without-election procedure should be substituted for legalization of pre-hire contracts if construction industry amendments remain tied to labor reform legislation. This inclusion is part of the political strategy now being used on Capitol Hill.

(Both proposals are devices to get around the present impracticability of holding union-representation elections in the construction industry.)

NSPE's concern is over the impact of the proposals on the representation rights of professional engineers. The present law gives professional workers the right to vote separately on union representation and makes it impossible to put professionals and nonprofessionals in the same bargaining unit without the consent of the professionals. NSPE says this protection would be lost under the pre-hire proposal but preserved under the certification plan.

The Department of Labor and Sen. John Kennedy (D., Mass.) have assured NSPE, according to the society, that the certification proposal would not affect the "self-determination" rights of professional engineers. But NSPE wants this assurance specifically written into the bill.

Since NSPE is asking that these "separate election rights" remain "inviolate," it is in fact asking for total exclusion of professional employees from either the pre-hire or certification proposals. Because of the very nature and purpose of the proposals, there is no room for the exercise of "election rights" except in the limited realm of the veto power granted employees under each proposal.

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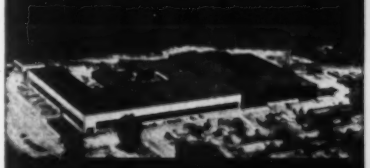

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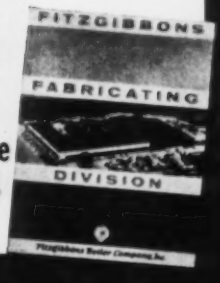

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RATE: The rate for Official Proposal advertising is $2.40 per line or fraction set solid. Where the advertisement is set other than solid, the space is measured by total space occupied and charged on basis of 12 lines to the inch.

CLOSING DATE: Friday 10:30 A.M. for issue dated the following Thursday.

SEND COPY TO: Official Proposal Division, Engineering News-Record Class. Adv. Div., P. O. Box 12, N. Y. 36, N. Y.

Bids: March 12, 1959.

New York State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.,—Pursuant to the provisions of the Highway Law, and special provisions for projects financed with Federal Aid Funds, sealed proposals will be received until ten-thirty o'clock A. M., eastern standard time on the 12th day of March 1959, by Henry A. Cohen, Director, Bureau of Contracts, 12th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects:

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
DISTRICT No. 1, G. L. NICKERSON, District Engineer, 333 Broadway, Albany 1, New York.						
Schenectady	FATC 59-1	City of Schenectady-Crosstown Connection, F.A.C.57-18 Schenectady Crosstown Connection Pt. 2, F.A.S.H. 57-20 Project U-323(16)	1.99	Traffic Signal Devices	$1,500 Plans $5	$80,000
Schenectady	FATS 59-3	City of Schenectady-Crosstown Connection F.A.C.57-18 Schenectady Crosstown Connection Pt. 2, F.A.S.H. 57-20 Project U-323(17)	1.99	Traffic Signs & Delineators	$800 Plans $5	$11,000
DISTRICT No. 2, LACY KETCHUM, District Engineer, 109 No. Genesee Street, Utica 1, New York						
Hamilton & Essex (Rte. 28N)	FARC 59-15	Long Lake-Grove, S.H. 818; Newcomb-Long Lake Pt. 2, S.H. 5189 Newcomb-Long Lake Pt. 1, S.H. 5188 Project S-210(2)	9.19	Asphalt Conc. Type 1A Pavt. = 9.16 Mi. Misc. Work = 0.03 Mi.	$100,000 Plans $5	$1,764,000
Oneida	FASS 59-6	Henderson Street (Co. Rd.) Project S-537(1)	0.75	Asphalt Concrete Pavement	$12,000 Plans 15	218,000
DISTRICT No. 4, B. F. PERRY, District Engineer, Barge Canal Terminal, Rochester 1, New York						
Monroe (Int. Tour. Rte. 490)	FITS 59-2	Interstate Route Conn. 580 (Rochester-Bushnell Basin Pt. 1 and Pt. 2, FASH 54-1 & FISH 56-9) Project I-1107(9)	6.69	Traffic Signs and Delineators	$1,500 Plans $5	$79,000
Wyoming (Rte. 19)	FARC 59-16	Pike-Gainesville, S.H. 8121 Project S-177(3)	4.66	Asphalt Conc. Pavement	$24,000 Plans $5	437,000
DISTRICT No. 6, JAMES H. THOMAS, District Engineer, State Office Bldg., 30 West Main Street, Hornell, New York						
Steuben (Rte. 36 & 248)	FARC 59-11	Hornell-Canisteo, S.H. 5212 Canisteo-Jasper, S.H. 5348 Canisteo-Whitesville Pt. 1, S.H. 5547 Project F-367(5); F-477(3)	2.26	Asphalt Conc. Pavement Rehabilitation of 2 Exist. Bridges	$72,000 Plans $5	$1,307,000
DISTRICT, No. 8, KURT G. RAUER, District Engineer, Pleasant Valley Road, Poughkeepsie, New York						
Columbia (Rte. 9)	FARC 59-13	Stottville, S.H. 649 Stottville-Stuyvesant Falls, S.H. 5103 Project F-368(11)	2.44	Asphalt Conc. Pavement	$12,000 Plans $5	$211,000
Ulster (Rte. 28)	FARC 59-17	Ulster-Delaware Pt. 3, S.H. 31 Project F-659(7)	4.27	Asph. Conc. Pavt. = 4.25 Mi. Misc. Work = 0.02 Mi. Prestress. Conc. Beam Viaduct 15 Span 1080', Prestress. Conc. Beam Bridge 1 Span 223.4'	$128,000 Plans $5	2,324,000
DISTRICT No. 9, JOSEPH C. FREDERICK, District Engineer, 71 Frederick Street, Binghamton, New York						
Otsego (Rte. 166)	FARC 59-14 FASH 59-6	Milford-Roseboom, S.H. 8226; Cherry Valley-Roseboom, S.H. 786; East Springfield-Cherry Valley, S.H. 934; Cherry Valley-Sharon Springs-Sharon Springs-Canajoharie Pt. 1, S.H. 8064 Cherry Valley-Sprout Brook Pt. 1A Project F-385(3)	6.60 (0.16 Acc.)	Asph. Conc. Pavt. = 6.60 Mi. (0.16 Mi. Asp. Conc. on Access Work)	$80,000 Plans $5	$1,452,000
Sullivan (Rte. 17)	T.S. 59-4	Monticello-Liberty Pt. 2, S.H. 5322 Liberty Village, S.H. 5296 Liberty-County Line, S.H. 5223	6.13 (4.56 Acc.)	Traffic Signs and Delineators	$3,200 Plans $5	57,000
DISTRICT No. 10, M. E. GOLT, District Engineer, 325 W. Main Street, Babylon, L. I., New York						
Suffolk	SSPRC 59-1	Southern State Parkway (Wellwood Avenue to Udalls Rd.)	6.11 (4.67 Acc.)	8" Cem. Conc. Pavt. (With Carbon Black) 2.66.37' Var. Wide = 5.83 Mi. 8" Cem. Conc. Pavt. Var. Wide = 4.46 Mi. Asph. Conc. Pavt. = 0.26 Mi. Misc. Work = 0.23 Mi. Lengthen 3 Exist. Hy. Seps. Rigid Frame Arches By 1 Span Each 69.3', 69.5' and 66.6'. Widen 2 Exist. Hy. Seps. Rig. Frame Arches 30.0' and 69.2' Spans-1 Hy. Sep. Rig. Frame Arch 2 Spans 143.2' 1 Br. Rig. Frame Arch 52.2' Span	$400,000 Plans $10	$6,929,000

Any projects in this letting that are on the Federal Aid highway systems are subject to the provisions of the "Federal-Aid Highway Act of 1956", being Public Law 627, 84th Congress, approved June 29, 1956, and are also subject to the applicable New York State statutes.

In compliance with the provisions of Section 115 (Prevailing Rate of Wage) Public Law 627, the minimum wages to be paid laborers and mechanics are included in wage schedules that are set out in the bid proposal.

Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for Plans and Proposal Forms for each contract is indicated above. A refund will be made in full to bidders for return of one set, in good condition, within 30 days of award, or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Special attention of bidders is called to "Information for Bidders" in the Public Works Specifications, and to the special provisions applying to projects financed with federal funds. Award of a contract is subject to priorities and allocations under the Defense Production Act of 1950, as Amended, and all regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bond shall conform to the provisions of the Highway Laws, as set forth in "Information for Bidders".

The right is reserved to reject any or all bids.

J. BURCH McMORRAN
SUPT. OF PUBLIC WORKS

Bids: March 31, 1959

Triborough Bridge and Tunnel Authority

SEALED BIDS WILL BE RECEIVED BY Triborough Bridge and Tunnel Authority at its office, Administration Building, Randall's Island, Manhattan, New York 35, N.Y. as follows:

Until 11 A.M. on Tuesday, March 31, 1959 For Throgs Neck Bridge Contract No. TN-126, Bronx Plaza Roadway and Cinder Storage Structure, Borough of the Bronx. The bid must be accompanied by a deposit in the amount of $80,000.00.

Plans, specifications and contract documents may be purchased at the office of the Authority for $40.00 which will not be refunded.

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enable you to get the greatest variety of bids —and so to get the lowest prices consistent with the best work.

OFFICIAL PROPOSALS

Bids: March 12, 1959

Notice to Contractors

STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of Highway Law, sealed proposals will be received until 10:30 a.m. Eastern Standard Time on March 12, 1959, by Henry A. Cohen, Director, Bureau of Contracts, 12th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y. for:

SOIL EXPLORATIONS AND FOUNDATION INVESTIGATIONS AT VARIOUS SITES ON CLOVE LAKES EXPRESSWAY, GOETHALS BRIDGE APPROACH TO VICTORY BOULEVARD. FAI ROUTE 512, PROJECT 1-1066(18), ITEM 28B, RICHMOND COUNTY, WHICH CONSTITUTES CONTRACT SPEC. NO. FA-SM-134.

Maps, plans and specifications may be examined and obtained at the following offices:

(a) Bureau of Contracts, 12th Floor, The Governor Alfred E. Smith State Office Building, Albany 1, N. Y.

(b) Mr. M. E. Goul, District Engineer, New York State Department of Public Works, 325 West Main Street, Babylon, Long Island, New York.

(c) Mr. William M. Trainer, Associate Contract Engineer, Department of Public Works, 270 Broadway, New York City.

The deposit for a set of plans, specifications and proposal forms is $5.00. A refund in full will be made to bidders for return of one set in good condition within 30 days of award or rejection of bids; refund for all other sets in good condition, similar period, will be 50 percent of deposit.

The Engineer's Estimate of cost for this work is $22,275.00.

Proposal for this contract must be submitted in separate sealed envelope with the name of the contract plainly endorsed on the outside of the envelope. Proposal must be accompanied by draft or certified check, payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum of $1,500.00. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law, as set forth in "Instruction to Bidders".

The right is reserved to reject any or all bids.

J. BURCH McMORRAN
SUPERINTENDENT OF
PUBLIC WORKS

Bids: May 1, 1959

Comision Ejecutiva Hidroelectrica Del Rio Lempa

Sealed Bids (Contract Documents 225-1) will be received at San Salvador, El Salvador, C.A., until 4:00 PM. CST, May 1, 1959, for furnishing labor, materials, and equipment for General Construction for Unit No. 4 to the existing underground powerstation "5 de Noviembre" Hydroelectric Plant (formerly known as the Chorrera del Guayabo Project), located on the Rio Lempa situated in the North-Central part of El Salvador, Central America. The principal items of construction are: 18,000 cubic meters of rock excavation; 1,500 cubic meters of concrete; 70,000 kilograms of penstocks, tainter gates, and trashracks to install. Completion time 500 calendar days.

The Contract Documents require prequalification of bidders and the following information must be submitted for prequalification: list of similar work with dates, total amount of contract, and references from clients, list of equipment available for the work and ownership of same, statement of financial resources, banking references, and other information by which Owner to submit a proposal can be judged. All pre-qualification information must be sent to both the Comision Ejecutiva Hidroelectrica del Rio Lempa, Edificio Duenas 467, San Salvador, El Salvador, Central America, and Harza Engineering Company, 400 West Madison Street, Chicago 6, Illinois, USA. Contract Documents will automatically be issued to qualified bidders.

Bids must be submitted in triplicate in accordance with the Instructions To Bidders. A bid bond or certified check as guarantee will be required with each bid.

The right is reserved to make award on any bid or to reject any or all bids.

OFFICIAL PROPOSALS

Bids: March 26, 1959

Notice to Bidders

Sealed bids for the construction of proposed improvements to the sanitary sewerage system of Salisbury, Maryland, consisting of intercepting sewers, lift stations, and force mains (Schedule A) and lateral sewers and house connections (Schedule B), under G.S.A. Project No. MD 18-P-1016, Contract No. WPC-MD-15, will be received by the Salisbury Incinerator and Sewage Treatment Plant Commission at the City Hall, Salisbury, Maryland, until 2:00 P.M. (E.S.T.), Thursday, March 26, 1959, at which time and place the bids will be publicly opened and read aloud.

A summary of major items of work follows:

SCHEDULE A

10,400 L.F. 8" to 16" C.I. Pipe Sewers; 2,150 L.F. 8" and 15" Clay Pipe Sewers; 3 Sewage Lift Stations; 760 L.F. 6", 8", and 10" C.I. Force Mains; 720 V.F. Standard Manholes; 11 Diversion Manholes; 270 MBM Sheeting Left in Place; 450 C.Y. Select Material (Borrow); 90 C.Y. Concrete for Cradles, Jackets, etc.; 1,300 Tons Mineral Aggregate, 3,000 Gallons Bituminous Material, 350 Tons Bituminous Concrete, and 650 C.Y. Portland Cement Concrete for Temporary and Permanent Repaving.

SCHEDULE B

190 L.F. 8" C.I. Pipe Sewers; 970 L.F. 8" Clay Pipe Sewers; 1370 L.F. 6" C.I. and Clay Pipe Sewers; 60 V.F. Standard Manholes; 105 Tons of Mineral Aggregate, 45 Tons Bituminous Concrete, and 110 C.Y. Portland Cement Concrete for Temporary and Permanent Repaving.

This project will be financed with funds furnished by The City of Salisbury, together with Federal and State grants obtained under the provisions of Public Law 660 as enacted by the 84th Congress, Second Session and Chapter 741, Acts of 1957 of the General Assembly of Maryland.

The attention of bidders is directed to the Special Conditions (Section 3) covering this work, which includes the Anti-Kickback Regulations issued by the Secretary of Labor (29 CFR, Part 3) and other special requirements.

Plans, specifications, and other contract documents may be examined at the office of Colonel Ernest L. McLendon, Executive Secretary of the City of Salisbury, located in the City Hall, Salisbury, Maryland, or may be obtained from Clarke Gardner and Percy Sterling, Consulting Engineers, Calvert and Bond Streets, Salisbury, Maryland, upon deposit of $25.00 for the initial set and $15.00 for each additional set. The original deposit of $25.00 will be refunded in full to all bona fide bidders upon return of the documents (in good condition) within 30 days after filing of bids. No refund will be made to non-bidders or for each additional set of documents obtained by bidders.

Each bid must be accompanied by a properly prepared bid bond satisfactory to the Commission in an amount not less than 5% of the total bid. A surety bond in an amount not less than 100% of the contract price will be required from the successful bidder. The surety bond shall contain provisions for the protection of persons supplying labor and material, performance of contract, and guaranty period as embodied in the Performance Bond attached to the Contract Documents.

No bidder may withdraw his bid within 45 days after the actual opening of bids.

The Commission reserves the right to consider informal any bid not prepared and submitted in accordance with the provisions of the Contract Documents and may waive any informalities in or reject any and all bids.

SALISBURY INCINERATOR AND
SEWAGE TREATMENT PLANT
COMMISSION
Fred A. Grier, Jr., Chairman
Henry W. Roberts, Vice-Chairman

February 19, 1959

Bids: March 25, 1959.

Legal Notice

Notice is hereby given that sealed bids will be received in accordance with the law by the City of Lima, Ohio, until twelve o'clock, noon, Eastern Standard Time on the twenty-fifth day of March 1959 at the office of the Mayor in the City Building, East Market Street and Central Avenue, Lima, Ohio, and will then be publicly opened and read.

The work to be done comprises furnishing all materials and labor, tools, plant and equipment necessary for constructing, installing and completing ready for operation a raw water storage reservoir formed by earth embankments and approximately two and three-tenths (2.3) miles of thirty-six (36") inch and fifty-four (54") inch pipelines, all in accordance with the drawings and specifications prepared by Buck, Seifert and Jost, Consulting Engineers and on file in the office of the Mayor of the City of Lima, Ohio.

Copies of the drawings and specifications may be examined without charge at the office of the Director of Utilities in the City Building, Lima, Ohio. Copies thereof may be obtained at the office of the Mayor upon deposit of Twenty-five ($25.00) Dollars, which sum will be refunded upon return of the drawings and specifications in good condition within thirty (30) days after the date on which bids are received or else the entire deposit will be forfeited.

The work to be performed is divided into two (2) sections.

The principal items of work under each section are as follows:

SECTION A—Constructing the earth embankment reservoir complete with inlet, outlet, overflow and drain structures, that part of the inlet and outlet mains to be installed under the embankment, gate valve vaults and the Lost Creek diversion channels with control structure.

SECTION B—Constructing the fifty-four (54") inch inlet main, the thirty-six (36") inch outlet main and the thirty-six (36") inch transmission main with accessories and connections.

Bidders will be allowed to bid on one or both sections.

Each proposal must be on the form provided by the City, which is a part of these specifications. Bidders may submit bids for each class of work performed by a class of artisans or types of work.

Each proposal shall contain the full name of each person or company interested in the proposal and must be accompanied by a certified check on a solvent bank payable to the City of Lima, Ohio or a bid bond to the favor of the City from a reliable surety company authorized to do business in the State of Ohio and satisfactory to the City, in amount equal to ten (10%) percent of the proposal. The certified check will be forfeited or the bid bond will accrue, in case the successful bidder shall neglect or refuse to enter into a contract in accordance with his proposal and properly secure its performance.

The City reserves the right to consider bids for thirty (30) days after the date of opening before awarding any contract, to waive any informalities and to accept the lowest and best bid. The City reserves the right to reject any or all of the bids.

CITY OF LIMA, OHIO
By: CLYDE WELTY
Mayor

Date of Publication: February 24, 1959

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-5161) will be received at Grand Junction, Colorado until 10 a.m. Mountain Standard Time, April 7, 1959, for furnishing labor and materials for Upper and Lower Molina Power Plants, Penstocks and Equalizing Reservoir, Collbran Project, Colorado. Location near Collbran, Colorado. Principal items are 150,000 cu. yds. excavation; 3,540 cu. yds. concrete; lump-sum—constructing power plant superstructures; lump sum—furnishing and installing penstocks, reservoir feeder line and discharge pipe; and other work. Completion by August 1, 1961. For particulars address Bureau of Reclamation, P. O. Box 360, Salt Lake City 10, Utah; P. O. Box 780 Grand Junction, Colorado; or Building 53, Denver Federal Center, Denver 25, Colorado. W. A. Dexheimer, Commissioner.

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-5162) will be received at Boulder City, Nevada, until 10 a.m., Pacific Standard Time, April 9, 1959, for furnishing labor and materials for Sheep Creek Barrier Dam, Paria River Basin, Utah. Location near Cannonville, Utah, in Kane County. Principal items are 36,000 cu. yds. excavation; 67,000 cu. yds. earthfill; 290 cu. yds. concrete; and other work. Completion time 280 days. For particulars address Bureau of Reclamation, P. O. Box 427, Boulder City, Nevada; or Building 53, Denver Federal Center, Denver 25, Colorado. W. A. Dexheimer, Commissioner.

OFFICIAL PROPOSALS

Bids: March 24, 1959

Notice to Contractors

Washington State Highway Commission
Department of Highways
Olympia, Washington
February 10, 1959

Sealed bids will be received by the Washington State Highway Commission at Olympia, Washington, on Tuesday, March 24, 1959, until 10:00 A.M. and will then and there be opened and publicly read for the construction of the improvement listed below.

Bid proposals delivered in person will be received only at the Reception Desk located on the first floor of the Transportation Building.

All bid proposals shall be accompanied by a bid proposal deposit in cash, certified check, cashier's check or surety bond in an amount equal to five per cent (5%) of the amount of such bid proposal. Should the successful bidder fail to enter into such contract and furnish satisfactory performance bond within the time stated in the specifications, the bid proposal deposit shall be forfeited to the State of Washington.

Prequalification of bidders is required. Maps, plans and specifications may be obtained from this office upon written request therefor and payment to the Director of Highways by cash, certified check, cashier's or money order in the sum of fifty-two dollars ($52.00) for each copy of such maps, plans and specifications. Two dollars ($2.00) of the above amount is a rental payment for the use of the maps, plans and specifications and is not returnable. The remaining fifty dollars ($50.00) is a deposit on the maps, plans and specifications and will be returned to the planholder providing the maps, plans and specifications are returned to this office not later than ten (10) days from the date of award of the contract. IF PAYMENT IS MADE BY CERTIFIED CHECK, CASHIER'S CHECK OR MONEY ORDER, PLEASE MAKE PAYMENT IN TWO CHECKS, ONE FOR TWO DOLLARS ($2.00) AND ONE FOR FIFTY DOLLARS ($50.00). Plans will be forwarded by First Class Mail.

Informational copies of maps, plans and specifications for the Second Lake Washington Bridge, Unit 1—Floating Structure are on file in the office of the Chief Consulting Engineer for the Washington Toll Bridge Authority, 3201 Fremont Avenue, Seattle, Washington, the Chapter Offices of the Associated General Contractors of America in Seattle, Spokane and Tacoma, Washington, and Portland, Oregon, the offices of the District Engineers of the Department of Highways and the office of the Director of Highways where they may be inspected. The improvement for which bids will be received follows:

1. Constructing a Reinforced Concrete Floating Bridge 1.424 miles in length in King County, SECOND LAKE WASHINGTON BRIDGE, UNIT 1—FLOATING STRUCTURE, a State Project, involving about 55,232 cubic yards of Concrete, 19,775 linear feet of Reinforced Concrete Railing, 7,458 linear feet of Precast Traffic Curb, 14,400 tons of Gravel, Sand and Rock Fill, 11,806,000 pounds of Steel Reinforcing Bars, 4,397,740 linear feet of Prestressing Reinforcement, 1,387,400 pounds of Structural Steel, 11,196 square feet of Steel Bridge Decking, 424 linear feet of Aluminum Bridge Railing, 174,400 pounds of Roller Tracks and Gears, 16,570 square feet of Steel Grating, 264,300 pounds of Cast Steel, 30,331 linear feet of Steel Anchor Strand, 288,100 pounds of High Strength Bolts and Cast Steel Washers, 3,600 pounds of Bronze Sliding Plates, 2,325 linear feet of Steel Pipe, 295 linear feet of Cement Asbestos Pipe, 221,800 pounds of Machinery, 38,800 pounds of Lift Columns and Counterweight Guides, 140 MBM of Treated Timber and Lumber, a lump sum bid for Mechanical Equipment, a lump sum bid for Electrical Equipment, a lump sum bid for Operator and Storage Houses and other items.

ERNEST J. KETCHAM, Chairman
W. A. BUGGE, Director of Highways

Contractors Watch This Section—

for new projects. Publish your announcements through the proposal sections of *Engineering News-Record* and get their bids.

OFFICIAL PROPOSALS

Bids: March 26, 1959.

Power Authority of the State of New York

For the Furnishing and Delivery of Gantry Cranes and Traveling Crane for Tuscarora Power Plant
Specifications No. PA-N-23022
Niagara Contract No. NP36

NOTICE TO CONTRACTORS. The POWER AUTHORITY OF THE STATE OF NEW YORK will receive sealed proposals for the Furnishing and Delivery thereof f.o.b. University Siding, Tuscarora Power Plant area, Niagara Falls, New York, of the Gantry Cranes and Traveling Crane for the Tuscarora Power Plant in Lewiston, Niagara Country, New York, until 10:30 A.M., Eastern Standard Time, on the 26th Day of March, 1959, at the Authority's office, 18th Floor, The Coliseum Tower, 10 Columbus Circle, New York 19, New York at which time and place proposals will be publicly opened and read aloud.

Bids will be received for one 150 ton and one 65 ton gantry crane, and one 340 ton traveling crane and associated equipment.

Delivery of the equipment will be required beginning March 1, 1960.

Plans, Specifications and Proposal Forms for the work, may be obtained from the Power Authority of the State of New York, 18th Floor, The Coliseum Tower, 10 Columbus Circle, New York 19, New York, upon application and prepayment of a fee of Ten Dollars ($10.00) per initial set of contract documents, and Five Dollars ($5.00) per set for additional sets, no part of which will be refunded. Plans, Specifications and Proposal Forms for the work will be on file in the Authority's office and in the offices of the Engineer, Uhl, Hall & Rich, 230 Congress Street, Boston 10, Massachusetts, and may be inspected by prospective bidders during office hours.

Bids must be made and returned in duplicate in accordance with instructions contained in the Information for Bidders. Guarantee will be required with each bid in an amount not less than 20 percent of the gross sum bid for that schedule which has the highest gross sum bid.

The right is reserved to reject any or all bids.

W. S. Chapin
General Manager

Bids: March 24, 1959.

Notice to Bidders

Poughkeepsie, New York

Sealed proposals will be received by the New York State Bridge Authority at its office at Mid-Hudson Bridge Plaza, Poughkeepsie, until 2:00 P.M. Eastern Standard Time on the 24th of March, 1959, at which time and place they will be publicly opened and read for the furnishing of the labor and materials necessary for the complete cleaning and repainting of the Bear Mountain Bridge spanning the Hudson River near Peekskill, New York, and for other necessary items of bridge maintenance and repair.

Plans, specifications, proposal blanks, form of contract, bond and information for bidders may be seen at the office of the New York State Bridge Authority, Mid-Hudson Bridge Plaza, Poughkeepsie, New York, at the offices of Modjeski and Masters, Consulting Engineers, Sixth Street at Forster, Harrisburg, Pennsylvania. Copies of the same may be obtained therefrom upon a deposit of Fifteen Dollars ($15.00), which sum will be refunded if the plans and specifications are returned by bidders in good condition within thirty (30) days of the date of the award of the particular contract or the rejection of bids therefor. A refund of fifty per cent (50%) will be allowed to parties other than bidders, unless otherwise directed by the Authority.

A certified check on a National Bank, State Bank or Trust Company in the sum of ten per cent (10%) of the amount of the bid, made payable to the New York State Bridge Authority must accompany the bid, as a guarantee that the contract will be entered into, if awarded.

A faithful performance bond in the sum of fifty per cent (50%) of the contract price will be required.

A labor and material bond in the sum of one-hundred per cent (100%) of the contract price will also be required.

The New York State Bridge Authority reserves the right to reject any or all bids.

JOHN S. STILLMAN
Chairman

EMPLOYMENT OPPORTUNITIES

Send NEW Ads and Inquiries to Classified Advertising Division of
ENGINEERING NEWS-RECORD,
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• POSITIONS VACANT

Wanted: Concrete Paving Foreman. At least 5 years experience in highway or airport paving. Location—Ohio. P-9691, Engineering News-Record.

Sanitary And Civil Engineers with several years experience in the field of water and sewage works and industrial wastes. Excellent opportunity with growing firm. Salary commensurate with ability. Paid vacations, holidays, hospitalization. Address reply with resume to: O'Brien & Gere, Consulting Engineers, 100 East Genesee Street, Syracuse 2, New York.

Resident Engineer—thoroughly experienced —for inspection and supervision of construction of large sewage treatment plant and intercepting sewers. Location New York State. Salary open. Address reply with resume to: O'Brien & Gere Consulting Engineers, 100 East Genesee Street, Syracuse 2, New York.

Streets Superintendent—requires 5 years experience in all-round street maintenance and cleaning operations; two years supervisory; age 30 through 50; written and oral exams given. Salary range: 192 to 600 with starting salary open. Write the Personnel Office, City Hall, City of Cedar Rapids, Iowa.

Wanted: Superintendent experienced in mechanical and structural work for Ohio construction company building sewage and water treatment plants, etc. Send detailed resume of education, experience, age, date of availability, references and salary requirements to P-9978, Engineering News-Record.

City Engineer—registered engineer with qualifying experience in supervision of sewage treatment plant, storm & sanitary sewers, street and sidewalk design and building code. Salary open as to qualifications. City Clerk, City Hall, Algona, Iowa.

Civil & Design Engineers Wanted by Illinois consulting firm. Salaries from $8000, depending upon ability. Permanent positions with paid vacation, sick leave, and profit-sharing plan. Unlimited opportunities for aggressive personnel as chief engineer in branch offices. P-1025, Eng News-Record.

Grading Superintendent for Highway, Airport and Railroad Construction. Year-round employment, must be sober and experienced. Engineering background desired. Location, midwest. State age, education, background, experience and salary desired. P-1034, Engineering News-Record.

Associate and Assistant Professors for fields of advanced dynamics, advanced strength and elasticity. Also have opening for graduate student as half-time instructor. Engineering Mechanics Dept., Kansas University, Lawrence, Kansas.

Experienced Reinforcing Steel Detailer. Excellent starting salary and usual benefits. New office and Plant under construction. Our employees know of this advertisement. P-1080, Engineering News-Record.

Business Manager—Controller for large building construction company in New York City, operating in several states. Executive caliber, experience with control systems, inter-department & field office coordination, knowledge of government private & sub-contracts, cost projections, completion schedules, purchasing, etc. Strong administrator with good business judgment to see that systems function & to be responsible for results. Ability to plug up loopholes, develop efficiency standards & cost controls. Complete charge of personnel. Outstanding opportunity for the right man leading to a vice presidency. Salary commensurate to proven ability. Submit detailed resume, stating salary requirement & availability. P-1090, Engineering News-Record.

(Continued on opposite page)

HIGHWAY DESIGN ENGINEERS

Opportunities in positions of responsibility for experienced highway design engineers.

Interviews arranged for qualified applicants only.

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P-1042, Engineering News-Record
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Work will be in the general offices in St. Louis. Interviews can be arranged in Washington, D. C., and San Francisco also.

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• POSITIONS VACANT

(Continued from opposite page)

Construction superintendent, engineering background, 49. Experience in construction power plants, sewage disposal, water filtration. Desires position with firm that needs combined supt., layout man and estimator. Will relocate. P-1070, Engineering News-Record.

Wanted: Qualified Clerk of Works for completely new general hospital with 73 beds. Bid price of $1,241,000 by well known Western New York contractor. Approximately 15 months duration for contract. Job starts about April 1, 1959. Salary open. Contact Wayne A. Manson, Administrator, Ira Davenport Memorial Hospital, Bath, New York. Phone PR 6-2141.

Estimator (Earthwork) Wanted by major construction equipment manufacturer. Background must include heavy experience estimating large earthmoving projects (dams, highways, etc.) Attractive location and fringe benefit program. Send complete resume including salary expected. P-1089, Engineering News-Record.

• EMPLOYMENT SERVICE

Salaried Personnel $5,000-$30,000. This nationwide service successful since 1927 finds openings in your field. Sells your abilities; arranges contacts. Present position protected. Write for details—Jira Thayer Jennings, P. O. Box 674, Manchester, Vermont.

• POSITIONS WANTED

Heavy and Highway Construction Superintendent Engineering—Estimating Experience Available soon. PW-9913, Engineering News-Record.

Resident Engineer—Architect's Superintendent. Varied Industrial and some Commercial experience. Registered Civil Engineer. Desires permanent position in Mid-West area. Available in February. PW-9894, Engineering News-Record.

BSCE. Young Single. 3½ years Civil-Sanitary Experience desires position in sanitary work. Field or Office. PW-9893, Engineering News-Record.

(Continued on the following page)

• POSITIONS WANTED

(Continued from preceding page)

Construction Engineer Field Layout—Supervision city work industrial plant, subdivision development, drafting ability—S.W. or S.E. area. P. O. Box 53-296 Miami, Fla.

Structural Engineer—Extensive experience. Registered. Desire executive position or partnership. PW-9993, Engineering News-Record.

Construction Executive and General Superintendent, 25 years experience in commercial, industrial, public buildings, and mass housing, experience includes all phases of construction, job management, purchasing, subcontracting, processing of claims, etc. Desire permanent relocation eastern U. S. PW-1006, Engineering News-Record.

Architectural Structural Engineer, long experience design intricate heavy structures, waterfront installations, highways, qualified to assume full responsibility. Top references. P. E. Preferred location: New England, New York. PW-9959, Engineering News-Record.

Construction Executive, thoroughly familiar all phases construction, i.e. estimating, supervision, business solicitation. Experience covers wide range diversified projects. PW-1021, Engineering News-Record.

General Superintendent wants position in Ohio, New Jersey, Pa., Maryland, Delaware or New York. At the present time is General Superintendent in the Midwest as superintendent of paving, bridges and grading. Has been Superintendent of Roads, Dams, and Air Bases. Will be available on March 15, 1959. PW-1003, Engineering News-Record.

Plant Manager—Fifteen years experience. 1,000,000 square feet; $300,000.00. Budget 10 years additional as City Engineer. PW-9995, Engineering News-Record.

Available March. Civil Engineer—Construction Superintendent. Age 33. Supervisory experience on industrial, commercial and institutional buildings, and on paving and earthwork. Interested in management opportunity. Will relocate. PW-9997, Engineering News-Record.

Civil Engineer, 28, BSCE, 7 years experience in estimating, construction supervision, surveying and design. Desires permanent position. PW-1031, Engineering News-Record.

Field Office Engineer—Estimator, 26, BSCE, heavy construction experience. Desires position with gen'l contractor, N. Y. area. PW-1031, Engineering News-Record.

Construction Supt. General Construction. PW-8896, Engineering News-Record.

Engineer B.S.C.E., 44, desires position in Central or Western Europe. Heavy experience in grading, paving, const., machy. and control. No design. 5 completed foreign contracts. Some French. $10,000 per annum minimum. Resume on request. PW-1035, Engineering News-Record.

N. Y. Licensed Surveyor desires position with opportunity, junior partnership or will consider purchase surveying business. PW-1067, Engineering News-Record.

Layout Engineer, Age 34, 6 years experience in Heavy Construction supervising several parties, also experienced in Optical Tooling for Indust. Machinery. Prefer Southeast will consider other. PW-1061, Engineering News-Record.

Canadian Civil Engineer—23—Single—With experience in industrial building and railway fieldwork desires foreign employment. PW-1063, Engineering News-Record.

Professor of Structural Engineering, 16 years experience teaching and industry, age 46, desires teaching position. PW-1059, Engineering News-Record.

Paymaster—35—Single. Full charge, will locate anywhere, best references. PW-1055, Engineering News-Record.

Electrical Engineer: Recently unemployed due to completion of construction program and R.I.F. Thirty-five years experience all phases of electrical and mechanical construction and operation. Married, no children, free to travel. Excellent health. Layout and design. Prefer field and construction. PW-1064, Engineering News-Record.

Admin. construction 10 yrs. office, field proven ability seeking work met. N.Y.C. area G.P.O. 1477 N.Y.C.

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W-1045, Engineering News-Record
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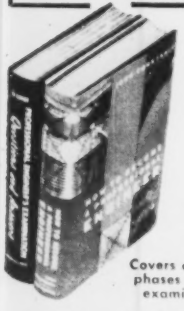

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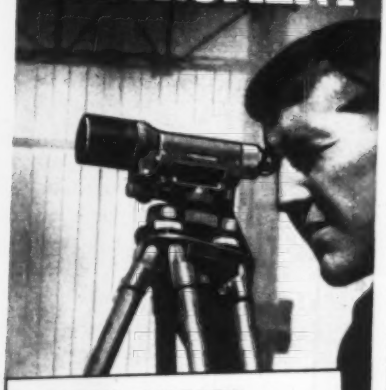

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Cutaway view of TRE Male Rod End.

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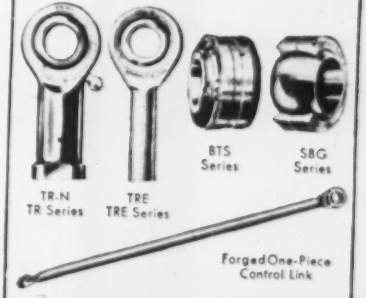

WRITE FOR CATALOG 257

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A Plea for Supervision

COLLAPSE OF CONCRETE STRUCTURES under construction brings us once again to emphasize that the failures might have been averted if the designers had supervised the field work.

Recently a small concrete highway bridge collapsed. Wet concrete was in the forms when the falsework gave way. Said a man on the job: "Too much weight for the forms." There was no one there to present the designer's reply: "Too little forms for the weight!"

Another example is the folded-plate precast roof that crashed to the ground in Skokie, Ill., last month (p. 23). The designer had not been engaged to inspect the field work. Since the cause of that failure has not yet been determined, one can only speculate on what might have gone wrong in the designer's absence during construction. Could the design have been faulty? Or was some field change made in a satisfactory design—a seating detail for folded plate on girder, perhaps, or a reinforcing bar splice detail? Or did some other unanticipated situation develop where the benefit of advice from an experienced designer would have been invaluable in avoiding trouble? We don't yet know.

In any event there appear to be too many cases of failures on projects where designers are not inspecting the field work. Field inspection is the the designer's responsibility. Experience has shown that shirking this responsibility may lead to a tarnished reputation, whether deserved or not. It has been said before, but it is advice worth repeating: Don't take a design contract if it doesn't also include the field supervision.

Opportunity for Service

IT NOW CAN BE HOPED that Engineers Joint Council, concerned with the nation's need for a definite transportation policy, will do something about it. EJC has been concerned for some time and has sought to find just who in Washington might share this concern. What it found was somewhat disappointing at first (ENR Sept. 11, 1958, p. 188), but fortunately EJC President Enoch R. Needles was not discouraged. He persisted and found a responsive audience in the White House and then in the Department of Commerce.

The department is now due to study the transportation field. Maybe EJC's persistence on the subject brought about interest in such a study. Meanwhile, the Senate Commerce Committee plans a study into such subjects as more favorable depreciation rates for railroads; proposals to allow railroads to own truck lines; expanded piggyback operations; freedom for railroads to lower rates where they are in competition with other carriers.

The Commerce Department's proposed study is not yet fully outlined. Secretary Lewis L. Strauss had a deadline last week for replies from interested groups as to what areas they think need investigation. His next move should be to set up the specific areas for study, then organize a staff to get at it. His over-all objective will be to redefine national transportation policy: New problems in the field will be studied, and chances are that legislative recommendations will be set forth with a view to orderly future development of the nation's transportation facilities.

How does EJC fit into the Congressional and Administration studies? It doesn't, as yet; and it's probably just as well. While the experts Engineers Joint Council can rally seem unlikely to be used extensively in the studies being started, EJC now seems bound to begin its own independent effort to work up a sound, nonpartisan statement of policy on transportation. Such an effort could be more meaningful ultimately than cooperation at this early stage either in the Senate Commerce Committee study, which may be somewhat narrow in its scope, or the Commerce Department study, not yet defined.

If either governmental study results in proposal of major transportation legislation in 1960—as seems likely—EJC could and should be ready with studied information and considered expert opinions that might help serve a good cause—establishment of a sound national transportation policy.

Education for the Boss

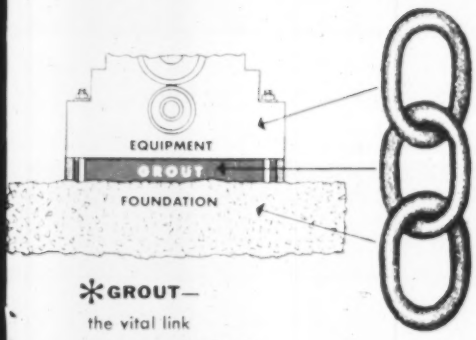
ADMIRATION HAS BEEN EXPRESSED here before for the Canadian Construction Association. It's an industry-wide organization of such stature that it rates an annual audience with the Dominion's Prime Minister and his Cabinet (ENR June 26, 1958, p. 96). Just last week we reported CCA's effort to help stabilize employment in Canada by fostering winter construction. In addition, the organization has a new plan for construction education that might bear emulation here in the U. S.

CCA has withdraw its offered fellowship for young civil engineers; it went begging for years as the young men were loathe to leave good positions, to sacrifice experience for schooling. Instead, CCA will consider short, intensive courses in modern construction techniques, to be offered to senior construction executives who can arrange a few winter weeks off for such studies.

The organization's labor relations committee has already arranged a two-week course in the complexities of labor legislation; it was given at Queen's University in Kingston. It is expected that short courses in job management, cost accounting and estimating will follow the pioneer session on labor relations.

Canada's venture into intensive "post-graduate" education for construction executives will bear watching.

. . . to withstand: **IMPACT • POUNDING ACTION • VIBRATION • SIDE THRUST • TORQUE**



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between equipment
and foundation

LEFT PHOTO... *Plain Grout* shrinks and leaves only a web of mortar and a small shim area to support bedplate . . . results in a *short-life* grout which causes costly shutdowns, possible equipment damage, and loss of production.

RIGHT PHOTO—*Embeco Non-Shrink Grout*... provides full bedplate support, maintains alignment and has high impact resistance . . . is a long-life grout that avoids trouble and cost of untimely re-grouting.

Full information on Embeco Pre-Mixed Grout and "Grouting Specifications"—a valuable guide on machinery and equipment grouting—on request.

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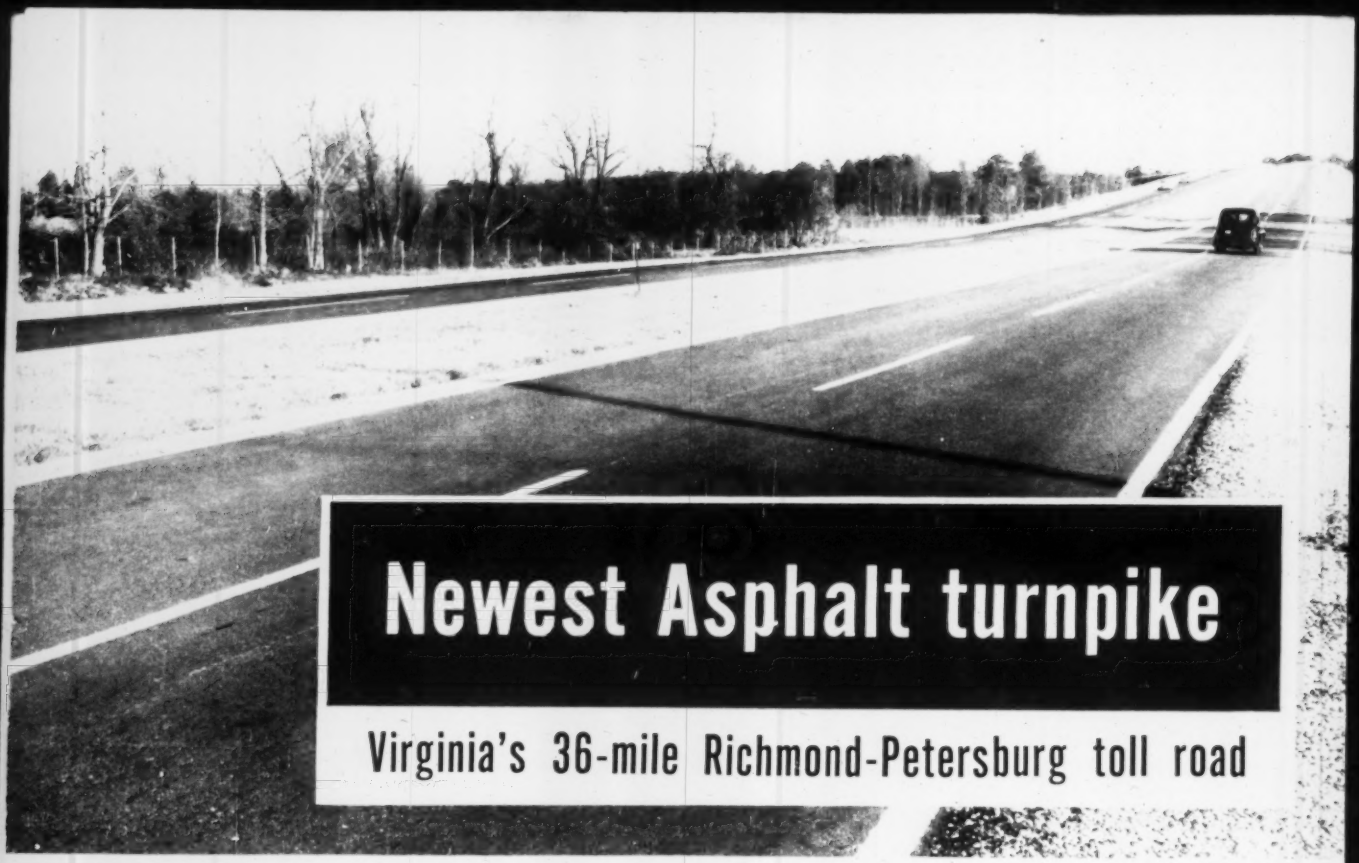
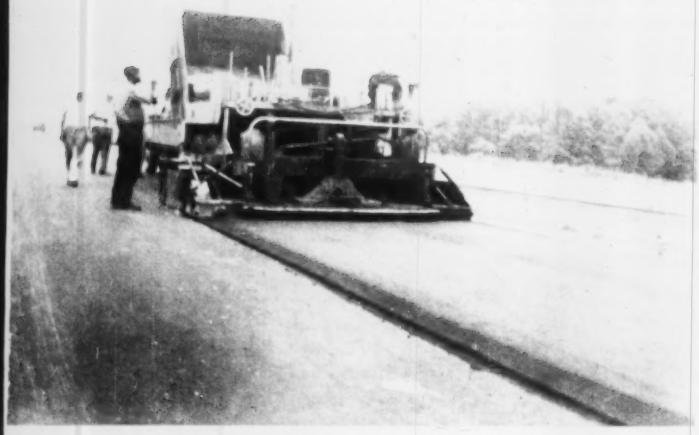


Newest Asphalt turnpike

Virginia's 36-mile Richmond-Petersburg toll road



View of 4.8 mile section at south end of turnpike. Texaco Asphaltic Concrete, laid in five courses, provides a 9½ inch foundation and wearing surface.
Contractors—Villa Contracting Company, Westfield, N. J. and Short Paving Company, Inc., Petersburg, Va.

Virginia's newly completed turnpike represents another important link in the Interstate Highway System. It is part of Interstate Route 95.

From Richmond to Petersburg, this major traffic artery has a heavy-duty, flexible Asphalt pavement. Competitive bids were received on Asphalt and rigid pavement of comparable design for sections of this toll road. As a result, Asphalt again demonstrated its lower cost and the substantial saving it makes possible in the construction of Interstate Highways, toll roads and other main traffic arteries.

Briefly, the Virginia toll road's pavement consists of a 2-inch wearing surface of fine aggregate, plant-mixed Asphaltic Concrete; a 7½-inch base of coarse aggregate, plant-mixed Asphaltic Concrete laid in three courses; and an 11-inch subbase of select borrow material.

Helpful information on the type of Asphalt pavement constructed on the Richmond-Petersburg Turnpike, as well as other Asphalt types, is supplied in the brochure, "Plant-mixed Texaco Asphalt Paving". Write our nearest office for a copy.

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